

2
August · 1952

finish

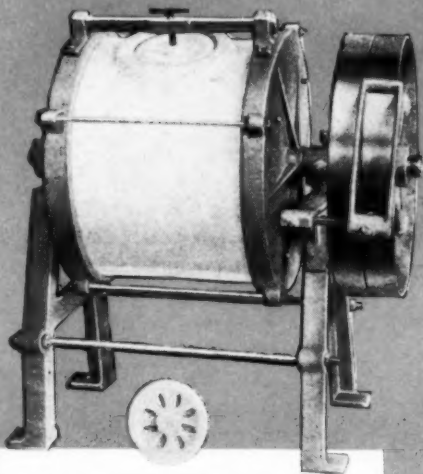
METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

For better grinding service
use

"Ceramic"

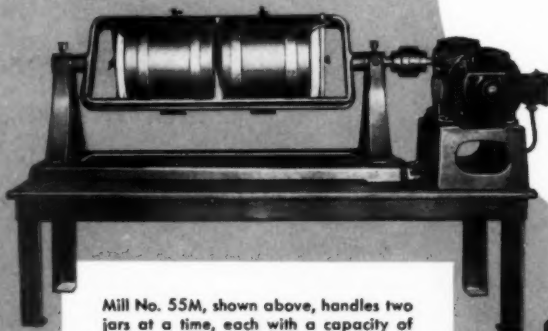
**PORCELAIN
JAR MILLS**



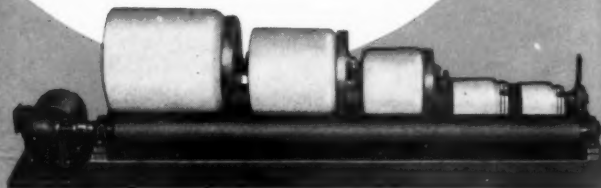
The Mill shown above, No. 11B, has a capacity of 100 pounds dry material. Similar in design, the No. 22A and No. 33A have dry material capacities of 50 and 25 pounds respectively.

Whatever your requirements "Ceramic" has a mill to meet them. All jars are made in one piece of the finest vitrified china available. Production tests have shown increased grinding service in comparison with other porcelains tested. Replacement jars are available from stock. Three popular mills are illustrated.

Write for the "Ceramic" Jar Mill Bulletin giving details and specifications of other mills and jars.



Mill No. 55M, shown above, handles two jars at a time, each with a capacity of 10 pounds dry material. The No. 44 is similar in type, with two jars of from 2 to 3 pounds capacity.



Roller Type Jar Mill No. R-7, above, accommodates four one-gallon jars, or any assortment of gallon and smaller jars. Other Roller Type Mills can be furnished, in larger and smaller capacities.



**COLORS
CHEMICALS
SUPPLIES**

**CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.**



finish SUGGESTION BOX

Sheet steel separator permits instant removal of top sheet from stack

A NEW sheet steel separator designed to permit instant removal of the top sheet of steel from a stack is currently being introduced by an eastern equipment firm.

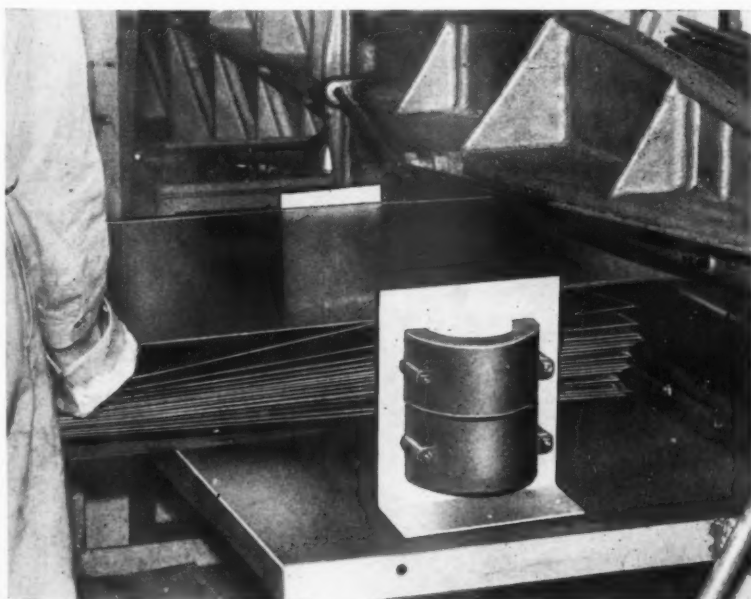
This sheet steel separator permits automatic separation of stacked steel sheets. Using the separator is claimed to increase production by eliminating lost motion and time in trying to pry oily sheets apart with hands or a sharp instrument. Experience has shown up to 100% increase in production in some applications.

When the separator is used, the top sheet is usually raised about 2" above the balance of the stack. As each steel sheet is removed, the next one is raised and separated ready for immediate transfer to a press or other metal working machine.

Using the automatic separator is said to prevent damage to expensive dies by eliminating the possibility of feeding double sheets into a press. The danger of the operator receiving severe cuts or bruised fingers is greatly lessened, as well as making the removal a faster, more efficient operation.

The separators are compact in size, and can be used singly or in pairs, depending upon the size of sheets being handled. Four sizes now available are 6½", 9", 10" and 15". The manufacturer states that sales will be made on an approval basis, subject to the customer's acceptance after trial.

Source for further information on this sheet steel separator may be obtained by writing finish.



RECORD ATTENDANCE AT ASTM 50TH ANNIVERSARY MEETING

A total of 2606 engineers and materials men set a new registration record at the 50th anniversary meeting of the American Society for Testing Materials, held at Hotels Statler and New Yorker, New York City.

Retiring president T. S. Fuller, engineer in charge of works laboratory, General Electric Co., Schenectady, spoke on "Some Gratifying Results". He noted the growth of ASTM specifications, the first ten of which were issued in 1900, to the present figure of some 1900 comprising over 10,000 pages.

As a result of recommendations of the some 70 committee reports at the meeting, 75 new specifications and tests were approved for publication. Most of the committees concentrated the first half of this year on revising their standards so they would be up to date for the 1952 edition of the big book of ASTM Standards to be issued later this year. Some 90 existing tentatives were recommended for adoption as formal standards subject to Society letter ballot.

FERRO OPENS PLANT IN JAPAN

The ninth plant operated by Ferro Corporation, of Cleveland, outside the United States, was opened recently at Osaka, Japan.

C. D. Clawson, Ferro president, stated that the starting production goal will be 5 million pounds of porcelain enamel frit per year. Milt Simmons, member of the technical staff of Ferro's International Division, is at present in Osaka advising the local staff on plant operation and market servicing.

FOOTE RECEIVES LITHIUM CERTIFICATES OF NECESSITY

Foote Mineral Company has received two certificates of necessity covering production of lithium chemicals as a portion of the 10 million pound per year goal set recently by the Defense Production Authority.

Here's **6** Good Reasons Why YOU Should Use **ING-RICH PORCELFRT**

1 LABORATORY CONTROL—Our ceramic engineers maintain constant contact with our Frit production staff to make sure of highest quality.

2 PLANT TESTING—Right in our own porcelain enameling plant, under conditions of actual use, we use PORCELFRT. When you get it, it's *right!*

3 FEWER REJECTS—PORCELFRT cuts rejects to a minimum.

4 EXPERIENCE—Since 1901 Ing-Rich has pioneered in porcelain enameling. We have learned a lot in that time about Frit—and our customers profit by this practical experience.

5 SERVICE ENGINEERING—Our service engineers are available to make sure that PORCELFRT works right for your product.

6 IMPROVED SMELTING—Ing-Rich uses the world's finest smelting method, the result of exhaustive research and experiment.



INGRAM-RICHARDSON, INC.

OFFICE • LABORATORY AND PLANT

FRANKFORT, INDIANA

THE finish LINE

THE PROBLEM OF DEFICIENT SERVICE—

on home equipment and appliances is becoming increasingly serious—to the extent that it can very readily throw up another road block against increased sales.

This page is of immediate interest to the builders of gas home heating equipment, but the problem is to some degree present for all home equipment and appliances, regardless of the fuel or motive power.

A letter to central gas heating customers

A user of central gas heating for over 15 years received the following letter dated July 1, 1952:

"To our Space Heating Customers:

This letter is important to you. Please take time to read it carefully.

"The increased popularity of gas for space heating is well known. With the recent completion by Texas Illinois Natural Gas Pipeline Company of the new natural gas pipeline serving this area, we were able to authorize installation of space heating equipment by a large number of our customers. When all of these have been installed, *we will be serving a greatly increased number of residential space heating customers. We are pleased that gas heat has achieved this recognition and acceptance, but at the same time it has created service problems which make it very difficult for us to continue to render the repair and inspection service to the extent it has been done in former years.*

"For example, each fall on the first few cold days we receive calls from about one-fourth of our space heating customers requesting us to light the pilots on their gas space heating equipment; naturally, we cannot take care of so many calls promptly. The other three-fourths of the customers either light their own pilots or leave them on through the summer. The cost of the pilot gas burned through the summer months is relatively small, and if you leave your pilot on, besides having the benefit of automatic heat available at any time, your heating equipment will last longer because the heat from the pilot evaporates moisture and helps prevent rusting. Incidentally, it also saves the service charge for relighting your pilot in the fall.

"There is one other matter we would like to call to your attention. *Your gas heating installation, like any other heating equipment, should be inspected and cleaned periodically. Because of the greatly increased number of installations now on our mains and to be connected, we are no longer in a position to furnish this periodic inspection work.*

"There are, however, many local dealers or service organizations who do such work regularly; *also some of the equipment manufacturers have service organizations available for this purpose. We recommend that you secure the services of a reliable organization and have your equipment inspected and*

cleaned. The best time, of course, to have it done is in the off heating season. If you do not know of such an organization or are unable to secure the services of one, *we will be glad to assist you in securing competent help.*

"Your cooperation will be very much appreciated. It will help us materially to handle the regular day-to-day service calls and thus be most effective in serving you."

LOCAL UTILITY

(Combination company)

Note: Italics are the editor's.

More business—less service

In most types of businesses, as sales increase it is customary to add the necessary personnel to maintain at least the same degree of service as was customary with fewer customers. In this letter, the need for service is emphasized—but—its availability is *reduced*. As to its ready availability, that is a hollow statement indeed, at least for customers in metropolitan centers today.

Another problem for the equipment manufacturers

It is not our intent to discuss the current problems of utilities, their rate structures or service responsibilities. Our interest is in the effect of diminishing service, regardless of the proper source, on sales and customer satisfaction.

A few serious accidents resulting from customer neglect, or inability to get service, can tear down acceptance that has taken years to build for a fuel, and the equipment designed to use it.

We are not suggesting that it is the responsibility of the equipment manufacturer to maintain national service organizations. We *are* suggesting that *someone* must make satisfactory, reasonable cost service available to the user of home equipment and appliances, or suffer the consequences in retarded sales and a very serious public relations problem.

What do you suggest?

Dana Chase

EDITOR AND PUBLISHER

For PURE Water

INDUSTRIAL WATER DEMINERALIZERS



Mill Room Water Nickel Dip Solutions Neutralizer Solutions

A Two-Bed INDUSTRIAL Water Demineralizer. Standard two- and four-bed units available with capacities of 200 to 1000 gph. Special units of any capacity engineered to requirements.

**you SAVE
many ways...**

Cost analyses are proving that the use of raw water in metal coating processes is not so cheap after all. This is especially true when mineral-free water can be obtained for a matter of cents per 1000 gallons in any quantity with an INDUSTRIAL water demineralizer.

The operation is very simple. Raw water is passed through alternate beds of ion-exchange resins, and it comes out free of all mineral salts. No steam, heat, still, or cooling water is needed — keeping space requirements at a minimum.

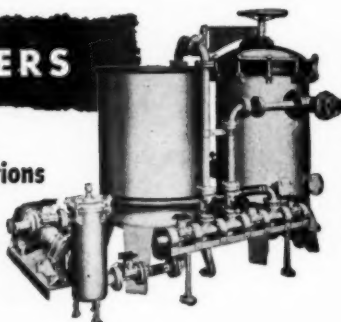
It's simple to get the complete facts for your case. Send us a water analysis and let us know how much water you have to treat and the gallons per hour needed. We can then give you the whole demineralizer story including estimated costs, equipment required, performance data, etc., for your requirements.

INDUSTRIAL FILTERS

for Clarification of Nickel Dip Solutions — Neutralizer Solutions ANY QUANTITY

A Typical INDUSTRIAL Filter. Standard portable and stationary models available with capacities of 100 to 15,000 gph. Special filtration systems engineered to meet unusual requirements.

Write for full information and recommendations.



INDUSTRIAL FILTER & PUMP MFG. CO.

5906 Ogden Avenue
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FILTERS	PUMPS	CORROSION TESTING APPARATUS
Pressure Type	Centrifugal	Salt Fog • Humidity
RUBBER DIVISION		
Vulcanized Linings • Molded Products	WATER DEMINERALIZERS	

MEETINGS

HOME LAUNDRY MFRS. MEETING

American Home Laundry Manufacturers Association, summer meeting, Mackinac Island, Michigan, July 27-30.

CENTRAL ENAMELERS OUTING

Central District Enamelers Club, fall outing and golf party, Alliance Country Club, Alliance, Ohio, August 23.

PORCELAIN ENAMEL FORUM

Porcelain Enamel Institute, 14th annual shop practice forum, September 10-12, University of Illinois, Urbana, Illinois.

PMI ANNUAL MEETING

Pressed Metal Institute, annual meeting, Pocono Manor, Pennsylvania, September 14-18.

WEST COAST ENAMELERS

Pacific Coast Enamelers Club, management-production meeting, Rodger Young Auditorium, Los Angeles, September 19.

IRON, STEEL EXPOSITION

Association of Iron and Steel Engineers, 1952 iron and steel exposition, Public Auditorium, Cleveland, Sept. 30 - Oct. 3.

PLUMBING, HEATING BUREAU

Plumbing and Heating Industries Bureau, annual meeting, Palmer House, Chicago, October 9.

PACKAGING ENGRS. SHOW

Society of Industrial Packaging and Materials Handling Engineers, 7th annual exposition and concurrent short courses, Coliseum, Chicago, October 14-16.

NAT'L METAL EXPOSITION

National Metal Exposition, Philadelphia, Pennsylvania, October 20-24.

PEI ANNUAL MEETING

Porcelain Enamel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., Oct. 22-24.

Fabricating fruit and vegetable juicers

a step by step production story of an interesting small appliance

by Howard Jackson



The Sweden Speed Juicer, manufactured by the Sweden Freezer Manufacturing Company, Seattle, Washington, is a consumer item for juicing all sorts of fruits and vegetables. It is sold on a national basis at \$100.00 each.

The operation of the deluxe juicer is easy and fast as no peeling or coring is necessary. The fruits or vegetables are simply washed and cut, then dropped into the juicer in opening the lid. The automatic feed does the rest. The juice is extracted by centrifugal force as the basket assembly inside the juice bowl whirls. An automatic feed opens the juice cells without bruising. It is this non-bruising process that is claimed to be the secret of the true natural flavor obtained from the juicer, with maximum vitamins and a mineral content up to 60 per cent more than by the other juicing methods.

Design and construction are simple but the juicer is carefully made with precision machined parts, and finished attractively. The machine stands 13 inches high on a 10 inch diameter base. It is equipped with a heavy-duty 1/4 h.p. motor, with grease-packed bearings (the motor and basket assembly being statically balanced for smooth performance, the cutter plates latex sealed on the underside before assembly). The exterior consists of a white molded bakelite lid trimmed in black, white plastic juice bowl, and two molded black bakelite housings beneath the bowl. The handle is highly polished nickel-plated steel. Metals and plastics are impervious to food acids.

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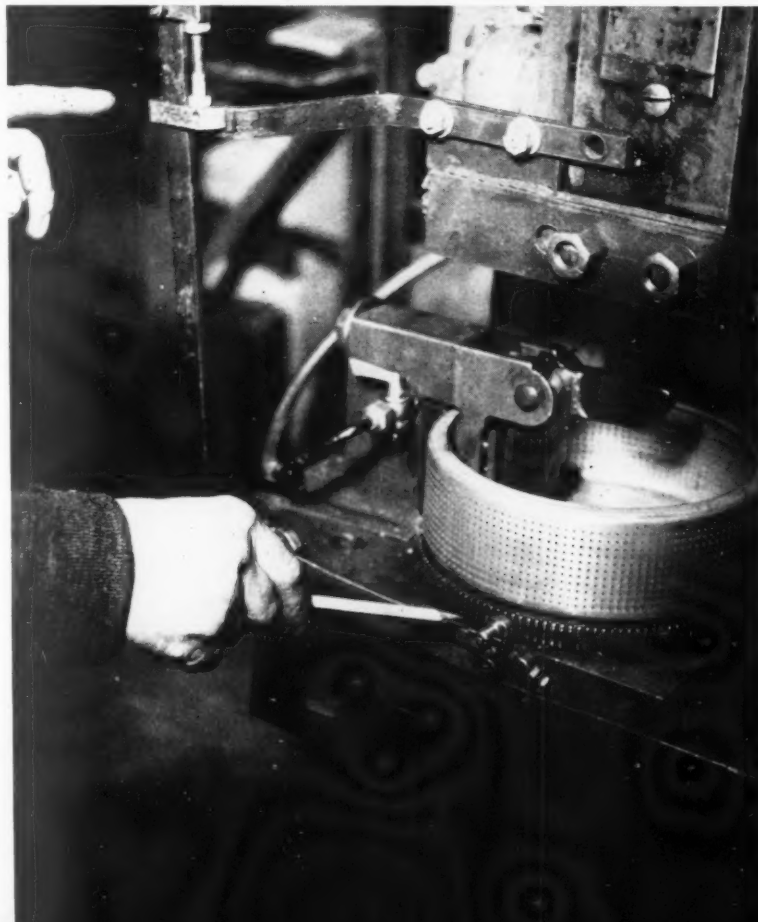
Let us take a look at the fabrication steps for the component parts. We'll start with the handle. It is made from 1/4 inch cold rolled round steel stock purchased cut to length (24 7/8 inches). It gets its basic shape in two operations on a punch press. One end of the rod is bent 1 3/8 inch and the rod bent about 100 degrees near that same end in the first stroke. The stop of the handle fixture is moved forward 3/8 inch, and the unbent portion of the rod is inserted

in the die, against the stop. A 1 inch bend is made in this end with a corresponding 100 degree bend. The handle then looks like the outline of a house with a fairly flat roof.

The handle is then taken to an adjacent punch press where a 12 inch circular die gives the circular shape to the "flat roof" in one stroke.

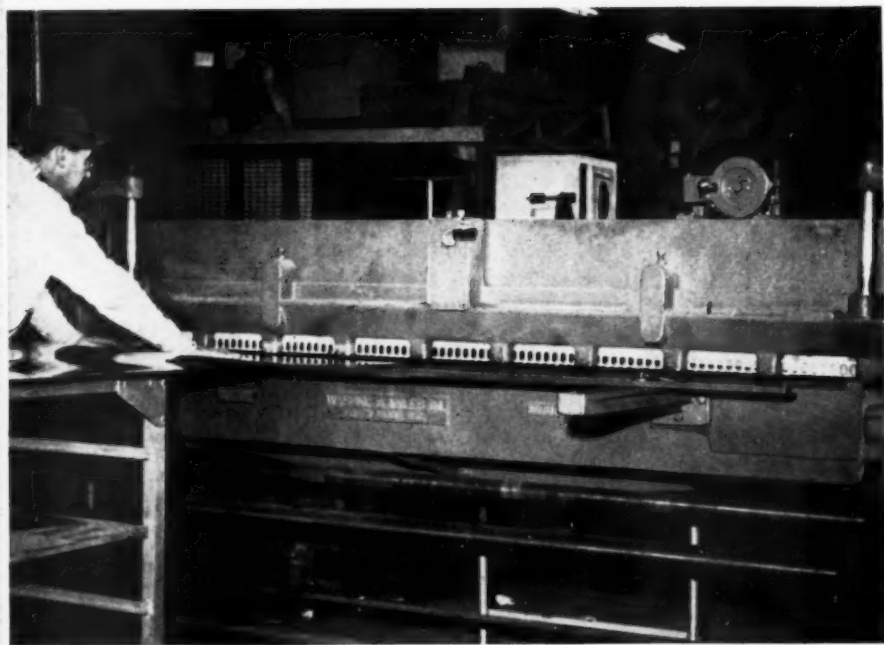
Next, the handle goes into a press brake. The final two operations are performed, using the same die set up, and the same wooden fixture which

A total of 1441 holes are punched in aluminum juicer basket, one row of 11 knocked out with each press stroke. Male die is fitted underneath ram and inside basket. Ram actuates circular table with 131 teeth, by shifting it one space with each stroke. Finger points out where arm is actuated and pencil shows how table is moved.





Left: Circular shape of juicer handle is pressed out, using a curved die in a punch press.



Center: An 8-foot shear is used to cut 20-gauge stock into 8-inch wide strips for cutter plates.



Bottom: Outer circle and inner hole is cut out of sheared cutter plate strips with one stroke of press.

acts as a gage. First two radii are made across the middle of the handle (where the handle springs over the lid), and then the final bends are made where the twisted ends will fit into the bakelite housing.

After the handles are nickel plated they are polished in Sweden's large polishing department. They are then ready for assembly.

Stainless steel disintegrator plates

The cutter (or disintegrator) plate which rests in the bottom of the basket is a little more complicated to make. First the 24 gage stainless steel stock is sheared into strips 8 inches wide on a shear. The strips are then put in a punch press, and with one stroke of the machine the outer circle and inner hole are cut out. The stiffening ribs are then put in with one stroke of a hydraulic press. The plate is then put back in the punch press where 230 V-shaped teeth, for grating, and four holes, for screwing the plate to the basket, are knocked out—one hole and $\frac{1}{4}$ of the teeth being knocked out—one hole and $\frac{1}{4}$ of the teeth being knocked out with each stroke of the machine.

The finisher then places the cutter plates, teeth down, on special trays ribbed in squares (after cleaning them with lacquer thinner, then wiping them with a tack rag to remove lint and fine dust). The cleaned, dried plates are then sprayed one misty coat with an adhesive cement, using a small gun, at 30 pounds pressure. They are allowed to set for 5 to 10 minutes to give the material time to start adhering.

Latex, diluted 7 to 1 with distilled water, is then sprayed onto the ex-

Right: Deburring 250 aluminum baskets an hour, using four-man team, and employing three polishing lathes.

Center: Static balance test for basket after cutter plate has been screwed to basket. If assembly stops rolling, man marks the spot with pencil.

Bottom: Spraying black molded bakelite lids with white baking enamel.

posed (back) side of the plates, using the same type gun, and pressure.

The trays of cutter plates are then baked in an electric oven for 30 minutes, at 230 degrees F. The rubber sealer self-cures in 48 hours at room temperature. They are then ready for assembly.

Basket has 1,441 holes

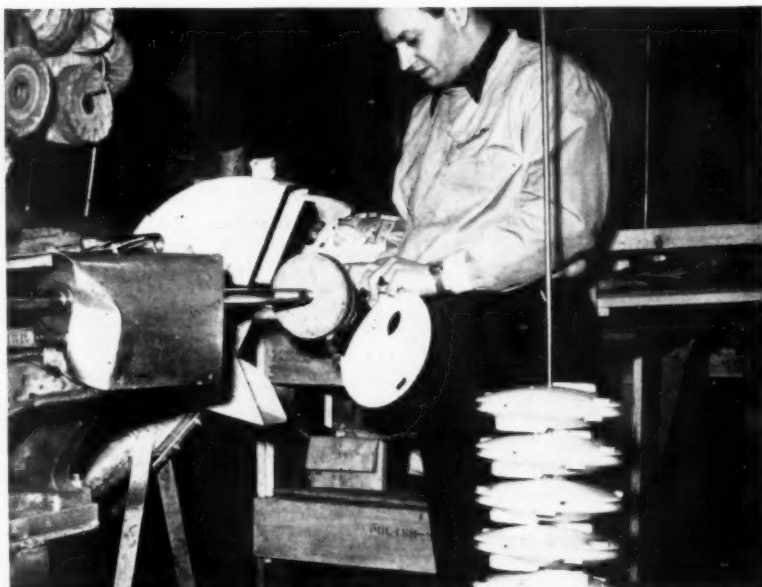
The best example of punch press work is the making of the baskets into which the cutter plates are placed. These aluminum baskets, with 1,441 holes around the sides, remove the juice from the pulp. The aluminum is cut to size on the shear, then spun to shape. The spun basket is then bolted to the step plate, and the male die fitted underneath the ram and inside the basket, in the punch press. When the ram comes down, one row of 11 holes is made down the side of the basket. When the ram goes up, a circular table, with 131 teeth stud-d around its side, shifts one space, thus moving the step plate and basket one space for the next row of 11 holes.

There are 131 rows. The arm which moves the table slots ahead is brought back into position each time by means of a spring. Air pressure pushes the slugs from the female die after the male die knocks out each row of 11 holes.

The juicer baskets are then de-burred in the polishing shop, using polishing lathes. Some 250 juicer baskets can be deburred an hour, using a four-man system of feeding the baskets, from one operation to the next. Three machines are used (one for deburring the small holes inside; one for the inside circumference; one for the outside circum-

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Spotting off white enamel from juicer lids on a polishing lathe, an old jewelry technique applied to industrial work to get two-color job.

ference), with one man operating each machine. The fourth man delivers the baskets to the operator of the first machine.

The baskets are then anodized, following which they go to sub-assembly to be matched up with the drive plates, by means of four screw and wing nuts. The hub, attached to the drive plate, sticks up through the center of the basket and cutter plate.

Static balance test

The basket, cutter plate, drive plate assembly is then given a static balance test by letting it roll along parallel steel bars. If the assembly stops momentarily the operator marks the high spot with a pencil. A corresponding piece is drilled out of the drive plate bottom to compensate, and correct the over balance.

When the assembly is balanced it

Component parts of the juicer. Assembled juicer in background shows handle and top side of lid. Left to right are bowl, automatic feed with automatic feed banking strip screwed to it and both attached to lower side of lid, and basket assembly with cutter plate in position.



is ready for final assembly operation.

Rough castings for drive plates are purchased on the outside, and machined up in a turret lathe. They then go to a mill and in one operation a slot is made in the bottom and a V cut made in the shot . . . to within 2/1000 of an inch of the center.

The plates are then taken to a drill press where they are first drilled with 3/16 inch holes, then mounted to the basket-cutter by means of the wing nuts and screws. (Then the entire assembly gets that static balance test).

(The starter, motor and shafts are purchased but the Sweden machine shop rough turns down the motor rotor shafts to size on an engine lathe. They are then sent out for finish grinding, following which they are drilled.)

The automatic feed is first purchased as a rough aluminum casting, then machined in an engine lathe, faced back and front, bored, drilled and counterbored. The feed then goes to a drill press and the remainder of the holes drilled. It is then deburred and flash is removed.

The automatic feed banking strip (3 inches wide and 11 inches long) is cut to length out of 20 gage stainless steel stock, and then has three 3/16 inch holes punched out at each end of the strip on a punch press. The strip is then buffed and deburred, and then rolled into its half moon shape in a hand roll.

The rolled feed banking strip is polished in the polishing shop to a satin finish. Then the strip is fastened to the feed by means of self-tapping screws. The feed and strip is then ready to be sub-assembled to the underside of the lid, by means of a bolt from the feed to a nut inset in the black bakelite knob (on top of the lid where the handle rests).

Finishing operations

After the necessary dowel and bolt holes have been drilled and then deburred on the polishing lathes, the molded, white bakelite lids, purchased on the outside, are cleaned with lacquer thinner, then wiped with a tack rag by the finisher. When air dry

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Holloware production in Holland

describing post-war production methods for enameled kitchen utensils

by Peter Rollmann • BAARN, THE NETHERLANDS



The plant of Anker Emaille Fabrieken N.V., Soestduinen, Holland, shared the fate of so many others in European countries during World War II. First, the Germans confiscated the machineries, moving the equipment to Germany, and later, during the fighting, the vacated buildings were bombed. After the war was over, we thus had to start more or less from scratch, filling the bomb craters, rebuilding and retooling the plant. This was not an easy task, since supplies were so short that even nails were among the critical materials.

On the other hand, the demand for ware, urgently needed by the population which had lost so much, was pressing and did not leave any time to wait for special equipment. Thus, for instance, the old furnaces had to be rebuilt in a hurry, and there was no time nor means for installing a modern continuous unit.

During the years that followed, efforts were made to improve some of the old-fashioned methods, and some results have been achieved so far.

Production is primarily concerned with the manufacture of porcelain enameled kitchen utensils which are finished in six different shades: black, blue, red, green, yellow and white. The various colors are applied on the outside only, and all goods are white inside. One more manufacturing difficulty consists of the production of so-called kitchen units, each of them comprising 24 different items such as sauce pans with lids, water

pails, spoons, frying pans, etc., all in matching colors. The idea is that a housewife or a housewife-to-be can purchase everything she needs in one buy.

These circumstances do not simplify the production problems, but the requirements of the market are stronger than the intentions of the manufacturer. Furthermore, in recent times the buyer's market has changed into a seller's market, which fact makes it still more difficult to get the needed elbowroom for materializing the

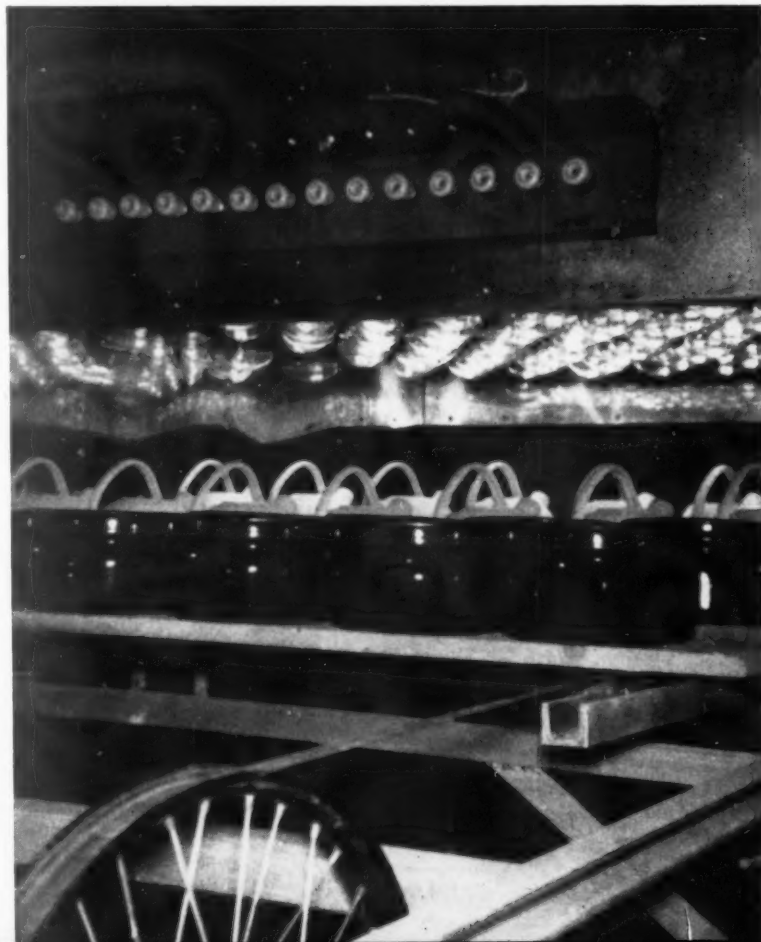
many planned improvements. In addition, heavy taxes restrict to a great extent the industrial development.

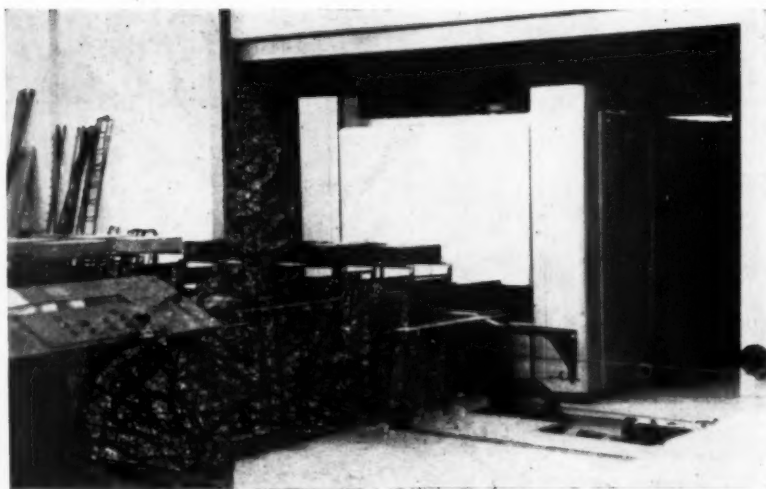
Fully automatic furnace

charging forks

The box-type furnaces (partly electrically heated) are equipped with electrically-operated, fully automatic charging installations. These are working in such a way that, simply, a clock has to be set for the desired burning time and the height to which the door of the furnace is required

Lamps for infra-red drying are shown located in top of drier tunnel.





Box-type furnaces, partly electrically heated, are equipped with electrically-operated fully automatic charging installations. All the operator in charge has to do is unload and reload burning tools.

to open, both according to type of enamel and type of article to be burned. With these two items once pre-determined and adjusted, the double-fork system will work automatically. All the operator in charge has to do is to unload and reload the burning tools.

The automatic cycle runs as follows: the door opens; the empty fork enters the furnace; discharges the furnace; sets charge on empty rolling support; fired and unfired charges on rolling supports shift over; fork picks up the new charge, enters and loads the furnace; and door closes after the fork is retracted. When burning time is up, all the movements start again, and the personnel has simply to follow the pre-determined, automatically regulated working speed. In case of an emergency, all the 16 separate movements which make up one complete loading-unloading cycle can be controlled from the control panel.

Infra-red drier has conveyor with height adjustment

Another feature of interest is a continuous infra-red electric drier, which gives quite satisfactory results within relatively short drying time. All the lamps are located in the top of the drier tunnel, as it has been found that no lamps are needed on the bottom or on the sides. A continuously operated exhaust fan

mounted on top of the drier provides for sufficient air circulation. At the same time it cools the lamps, thus increasing their life. The channel of the drier is lined inside with polished aluminum sheets which help to improve heat distribution and saving lamps due to the increased effect. The conveyor belts are made of thin metal strips such as used for crate strappings. The whole conveyor as well as the bottom plates of the tunnel can be lowered or raised in conform-

Aerial view of reconstructed plant which shared fate of many European plants bombed out during the war. Note that plant has access to a railroad whose tracks parallel the plant.



ity with the height of the items to be dried.

Ribbon heating equipment

Here are some additional facts about the factory. Two of the four furnaces are coke-fired but we have installed additional heating equipment (ribbons) powered by electricity, to achieve more accuracy in maintaining a constant temperature level. The amount of electricity fed

Editor's Note:

The author of this article has been visiting in this country as an exchange student sponsored by the Mutual Security Agency.

He spent several months working in American porcelain enameling plants, including Cribben & Sexton Co., Chicago; Ferro Corp., Cleveland; and Lisk-Savory Corp., Canandaigua, N.Y.

His article is concerned with the plant of Anker Emaille Fabrique, of which his father is president.

to these ribbons is controlled by a thermostat. Drying temperatures of the electric dryer are within the range of 360° to 400° F. Drying time is limited between 4 and 7.3 minutes, depending on the items being processed.

A compact finishing room for small parts

how one plant increased finishing capacity without benefit of extra floor space

by *Walter Rudolph*

finish

Several years ago, Astatic Corporation, in Conneaut, Ohio, faced the problem of maintaining high quality finishes on its pioneer line of microphones, phonograph pickups and related products, while increasing finishing capacity — but

Editor's Note:

This article should be of interest to most readers of *finish* since practically every manufacturing plant has a small parts problem.

without the advantage of having more floor space with which to work, and with the most strategic location for finishing facilities being a 40' x 40' x 20' room, near the heart of the plant.

Several interesting and efficient installations made it possible to increase finishing capacity to the point where parts are supplied for the assembly of several thousand products daily, without appreciable labor increase. Also, a more uniform quality finish (fine appearance and durability) was obtained.

Astatic supplies many of the leading manufacturers of electric phonographs, radio-phonograph combinations and related products, and thus must do a great deal of "custom jobbing" through the shop. The finishing facilities, designed to handle as high as 200 or more different parts, although fairly small, had to take this diversity into consideration too. Yet the present layout and equipment, in the compact room, do the work

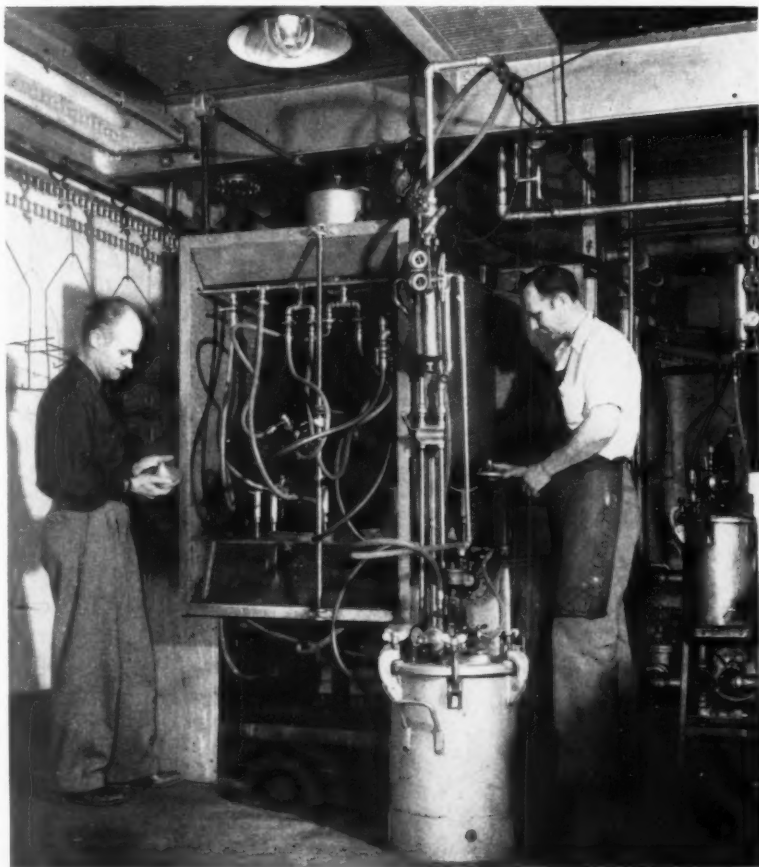
with from only five to ten workers.

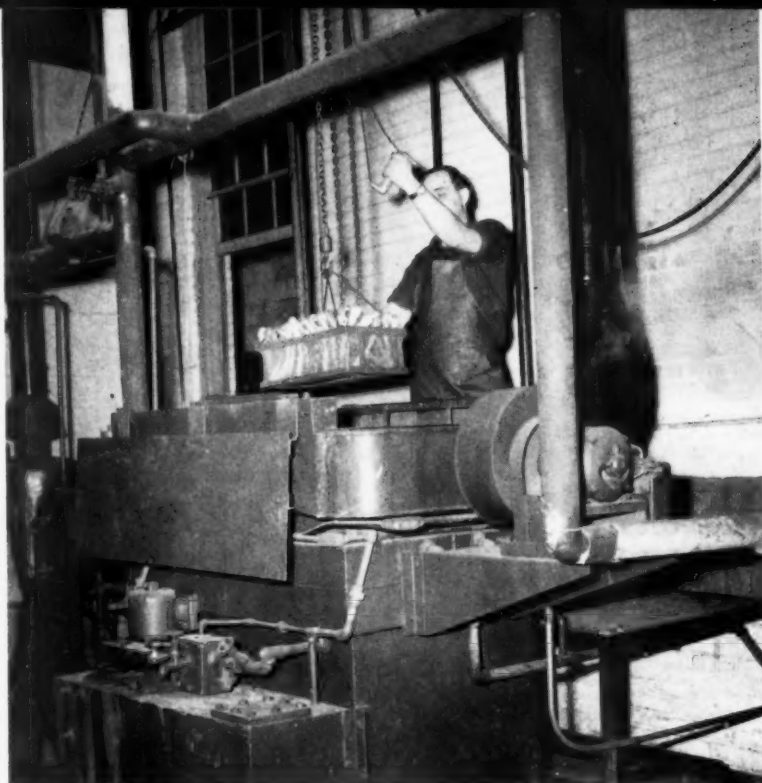
The 40' x 40' x 20' room had to be used in its entirety — which meant "going upstairs" for installation of some of the equipment. The room is located adjacent to grinding, sanding and cleaning areas, enabling much of the handling (small light parts) to be done manually. But diversity of pieces and speed required while

painting called for design and building of ten mobile racks.

These are simple multi-shelved rigs, of angle and strap iron, and various types of trays, to suit product shapes. They were designed to carry pieces to the painters, to receive some types of pieces after painting for handling through a convection floor-oven for baking, and for carrying finished

Automatic spray paint booth with circular-type 24-spindle table which is loaded on right and unloaded on left. Sprayer was not at station when photo was taken, so that hose arrangement could be shown in detail.





Cleaning and degreasing room, with efficient handling arrangement, is near the painting room. Phonograph pickup arms are shown going into the degreaser.

pieces, unloaded from a finishing room conveyor, to the assembly areas. Average size is about 2' x 4' x 6', and they sometimes carry as high as 5,000 pieces.

Four water wash spray booths, 4' x 4', were located along one wall, with an automatic spray booth of the same size. One of the speediest paint-

ing jobs, that of phonograph pickup arms, was conveyORIZED, with fixtures travelling roller-conveyors into twin booths from the left and right. After spraying, operator pushes the fixture to a roller-conveyor running from between the booths to an overhead monorail conveyor at the booths' rear. There the fixture is automatically

emptied, and the empty fixture drops to a lower level and returns by roller-conveyor to midway between the two painters.

Infra-red oven —an "upstairs" installation

The overhead conveyor runs the perimeter of the room, and is part of the "upstairs" installation. On a steel grating balcony, in the upper half of the 20-foot room, the infra-red baking oven occupies two adjacent walls, at right angles; the conveyor passes through this oven and returns to the lower level for take-off. Pieces from the automatic spray booth could also be hung on the monorail conveyor.

Racked pieces, after painting, can be backed into a double convection



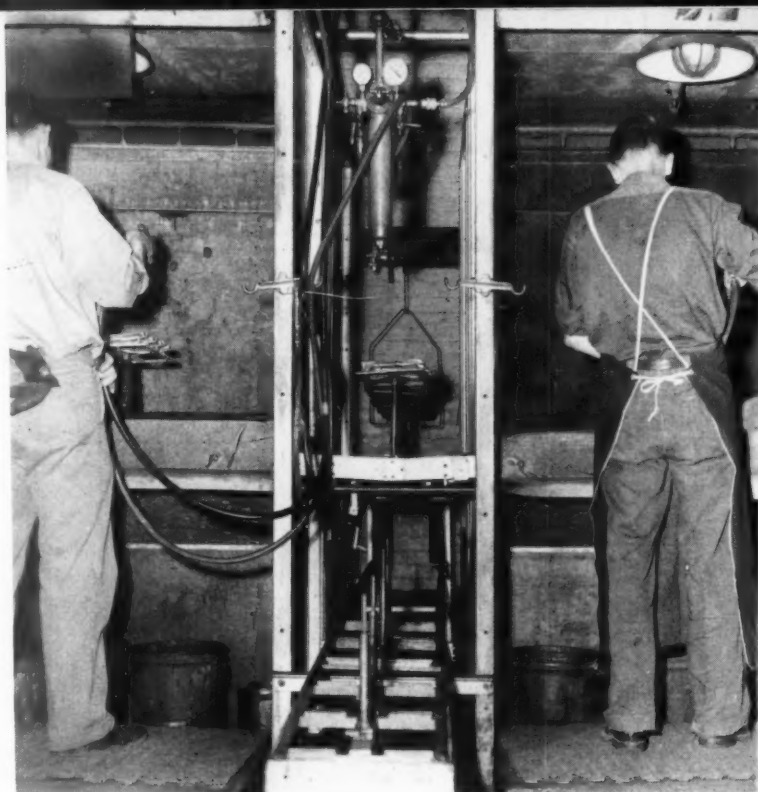
Convection-type baking oven is used for tray-loaded mobile racks, a handy means of carrying and drying many small pieces.

Fixtures holding painted phonograph pickup arms travel to overhead mono-rail conveyor (rear), and automatically unloaded and drop to roller conveyor (center bottom of picture).

heating oven. Use of either the conveyor or the racks depends upon fixtures and piece size, and type of coating applied. Astatic uses a lot of synthetic enamel, and a small amount of lacquer.

Air exhaustion

An important consideration to the entire compact operation is room temperature and air exhaustion. Two "upstairs" air conditioning units, each about 10,000 cfm capacity, draw air from the outside and warm it to about 80° F. for the room. It was figured that the room, with equipment displacement, ovens, etc., rated about 17,000 cfm to keep an equal pressure toward all vents, with about 3,000 cfm for preventing any air or



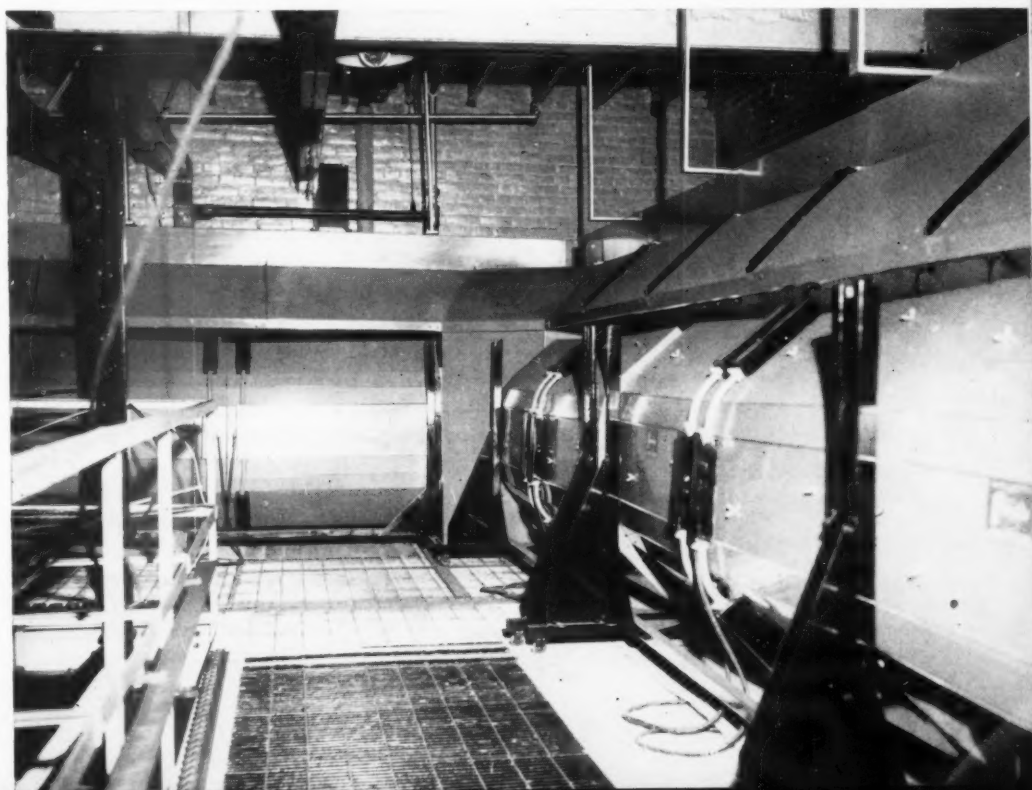
dust entering at the doors when swung open for rack or personnel passage.

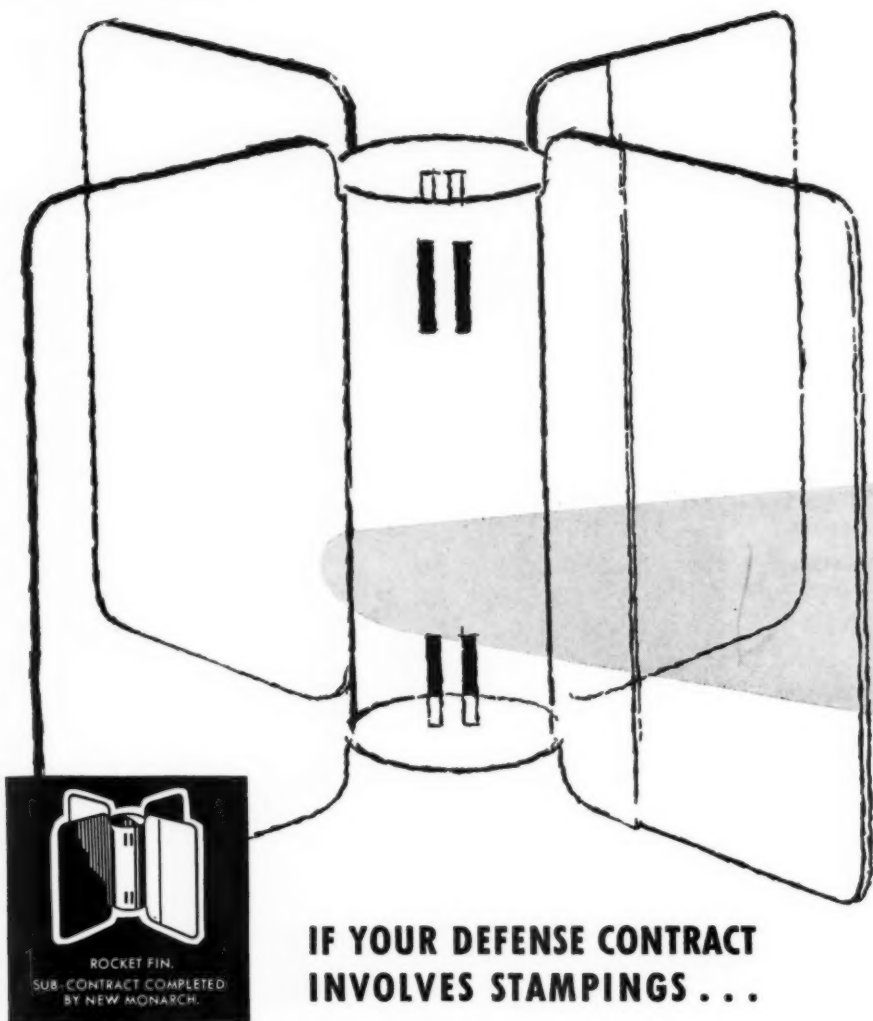
The roof underbracing is unusually strong for this compact finishing room, as about 16 per cent of the roof itself is cut away for duct work, over booths and air conditioning units, and the ovens. Then, too, the infra-red installation, and the air

units, are suspended from the ceiling.

Astatic also installed a short work bench and a series of "home-made" rollers, for fine graining work on some products, giving a wider versatility to finishing. Altogether, it is believed the compactness and efficiency of the installation would be hard to equal in any plant of this type.

View of infra-red baking balcony, with individual oven units on rollers for adjustment to different requirements. This is a right-angle installation, along two of room's walls.





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The effective utilization of paint

a report of test studies and an outline of basic information that could lead to a \$750,000 annual material saving in a single large organization

by K. W. Strom •

HEADQUARTERS MANUFACTURING ENGINEERING DEPARTMENT,
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.



Greater utilization of paint materials can be of prime importance in the search for ways and means to reduce the cost of material content in our apparatus. This is evident when it is realized that the cost of paint materials used by Westinghouse exceeds \$3,000,000 annually at the present time.

Observations reveal that such important factors as atomizing air pressure, materials pressure and the distance the spray gun is held from the work, affect paint utilization and must be given proper consideration in effective spray painting operations.

Spraying tests indicate that application of the basic information developed in the tests covered by this article could lead to economies in material usage up to 25%.

Paint coverage

Since the most effective utilization of paint materials depends upon the proper combination of the spraying elements, it was decided to make a thorough investigation of the influence exerted by these factors on spray painting efficiency and develop recommendations leading to improved practices. A large variation in the atomizing and material pressures was found at some plants in applying finishing materials of the same general type.

Some of the factors which affect the amount of paint used in obtaining desired coverage include:

- Atomizing air pressure
- Material (fluid) pressure

- Distance of spray gun from work
- Stroking of spray gun
- Paint material
- Viscosity of material
- Temperature of material
- Correct spray gun fittings—i.e. air caps, nozzles and fluid needles

Equipment and material used

A production spray gun equipped with an FX nozzle and a 765 or 704 air cap was used, these combinations being recommended for the application of lacquers and synthetic enamels. Additional equipment consisted of a pressure cup and necessary air controls and lines. The principal material used was a black lacquer. A rapid air-drying material was chosen to reduce the time required to obtain a dry film. However, a fast-drying enamel was also used as a comparison to check results. The viscosity of the material was held constant and the temperature maintained at 70° F. The spray gun accessories are those recommended by the equipment manufacturers.

Test procedure

The lacquer was reduced to spraying consistency with 2525 lacquer thinner, a viscosity reading taken, and a sample retained for the solids content determination. The weight per gallon was also determined.

A metal plate was suspended in the center of the booth to which were attached sheets of aluminum foil. These sheets were sprayed in sets of six for each fixed set of conditions.

Aluminum foil was chosen for these tests because of its non-absorbing qualities, ease of handling and

weighing, and less difficulties in evaluating appearance and finish.

Each sheet was numbered and weighed before spraying and weighed again when the applied film was dry, the weight difference representing dry film weight.

To determine material consumption, the pressure cup was filled with material and weighed together with the attached spray gun. After a set of sheets was sprayed, the gun and pressure cup assembly were weighed again.

With the solid contents of the material and the combined dry film weight on the sheets known, the material utilization obtained can be calculated.

Since the final appearance of the film had to be satisfactory, there was no attempt made to spray exactly the same amount of material in the various tests. As the controls on the gun remained constant, this variation in the amount of material sprayed was brought about by varying the average spraying time for each set of six sheets of foil.

Including preliminary check tests, more than 1000 tests were made involving a total of more than 4000 individual operations.

The great difficulty in obtaining identical film thicknesses in all tests led to the decision to base the conclusions on the actual percentage of sprayed material deposited on the foil.

Atomizing air pressure

In analyzing the results, a definite relationship was established between variations in atomizing air pressure

and material utilization. Constant material pressure of 5 lbs. per square inch was maintained during the tests. A reduction in material utilization occurred with increasing atomizing pressure, as shown on Curve No. 1.

It should be borne in mind that Curve No. 1 is not intended to be taken as an exact guide in determining the most efficient atomizing pressures for the spraying of all types of finishing materials, but only as an indication of the relation between pressure and efficiency. There is one most efficient atomizing pressure for every material, depending upon the material itself and the type of gun and fittings used in its application. The actual determination of the most efficient atomizing pressure for any material will be discussed under "Operational Information."

Material (fluid) pressure

To determine the effect of material pressure on paint utilization, various tests were made using 2-5-7-10-12 and 15 lbs. per square inch pressure. Constant atomizing air pressure of 50 lbs. per square inch was maintained during this series of tests. Additional checks were made to observe the trend which would be disclosed with 30 and 60 lbs. per square inch atomizing pressures. The results of these investigations show that paint utilization is not affected to any

important degree by changes in material (fluid) pressures.

Distance of spray gun from work

The distance that the spray gun is held from the work is of considerable importance as it governs both the appearance of the applied paint and material utilization. When the gun is held too close, an "orange peel" effect might be produced on the work, or, when the distance is too great, a rough film, "dusty", is usually the result and overspray loss as a rule is excessive.

A series of tests were made to determine the effect of distance on paint utilization. In these tests the gun was held at various distances from the work, with the distances ranging from 4" to 12". A study of the results reveal that the closer the gun is held to the work the greater the amount of paint deposited upon the object. The analysis further showed that for each 1" increase in distance from the work, an average loss of 3.5% in material deposition resulted.

While 4" from the work showed the best results, it was found that this distance made for uncomfortable working conditions in the spray booth, and difficulty was experienced in controlling the lapping of the strokes. It is recommended that for ease in operation and good material utilization, a gun distance of 6" be used. In any

event it should never exceed 8".

Stroking of spray gun

The speed of stroking is generally determined by the type of material and the size and shape of the object to be painted. Slow stroking may result in sags and runs, while too rapid stroking will result in a dusty appearance. The ideal speed of stroking is one that will cover the surface with a satisfactory coat with little overlapping from subsequent strokes. In this, as in other manual operations, the experience and know-how of the operator plays an important part in producing the required finish.

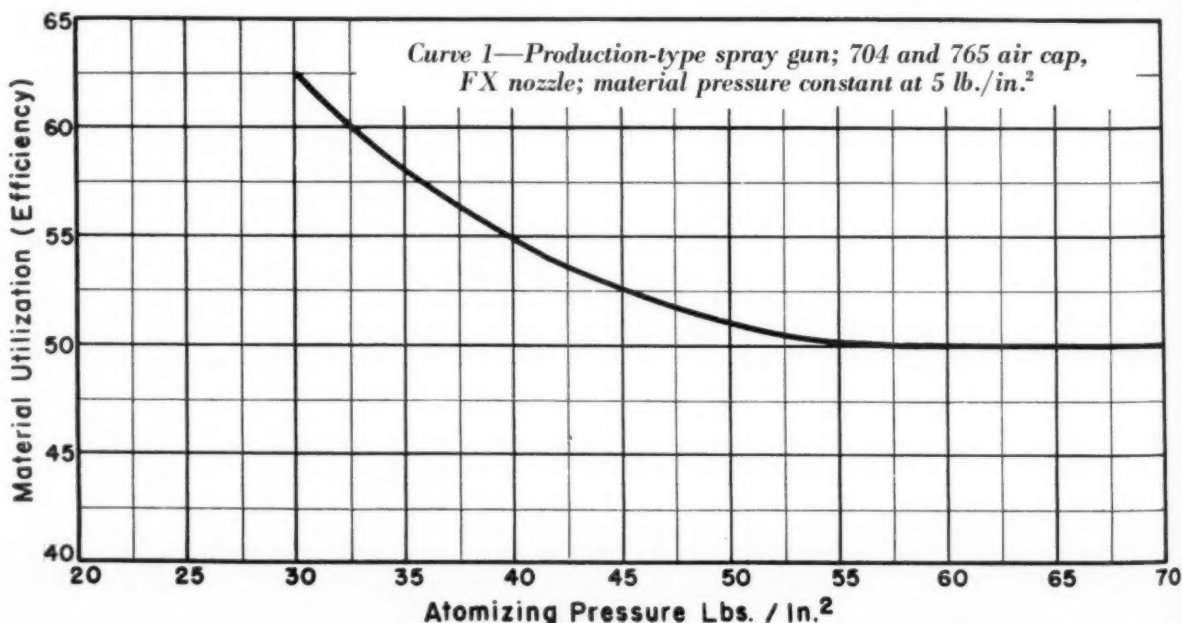
Paint material

As noted previously in this article, a black lacquer material was used in the spray out tests. To determine if the observed trends were materially influenced by the kind of paint sprayed, tests with a fast-drying enamel were made. A comparison of the tests show that there is a marked similarity between the results obtained from these materials. It is reasonable to assume that a comparison with other paint materials would show corresponding results.

Conclusions

There is a distinct advantage in low atomizing air pressure.

Material (fluid) pressure does not affect utilization to any marked degree.



The shortest distance that the gun is held from the work results in the greatest paint utilization. A distance of 6", not to exceed 8", is found to be the best for all practical purposes.

Ideal stroking of the gun covers surface with little overlapping from following strokes.

Comparison of several materials sprayed shows similar trends.

It is indicated that a savings up to 25% can be made at many plant locations if the above conditions are substituted for present practices.

Further studies of related painting equipment, materials and methods are being carried on by the Headquarters Manufacturing Engineering Department. The results of these developments will be published at a later date.

OPERATIONAL INFORMATION

The following remarks about spray finishing procedures may be of interest and assistance to painting men.

How to determine correct spraying pressures

After having seen that all equipment is clean and in working order, and that the material is of specified viscosity and temperature, proceed in the following manner:

1. Place object in booth or hang it on conveyor moving at production speed.
2. Set atomizing air pressure at regulator somewhere between 30 and 60 pounds.
3. Give spray gun to operator with fluid and air controls wide open.
4. When operator starts spraying, increase fluid pressure until he has sufficient material for the speed to do the work. Note this pressure.
5. Increase the pressure until the operator has too much paint to do the work properly. Note this pressure.
6. Reset the fluid pressure at a point half-way between the two pressures noted.
7. Reset the atomizing pressure to the lowest possible pressure that will give the desired finish. First, lower the pressure until the materials are sprayed out of control as indicated by sags and runs on the work. Then, increase the atomizing pressure gradually to the lowest pressure that will

give complete control of the material. Note the pressure.

8. Keep the two pressures unchanged.

9. Use the air and fluid controls to change the spray pattern according to size and shape of product being sprayed.

Handling of spray gun

The spray gun should be held perpendicular to the surface at all times and at a distance from 6-8 inches.

The proper gun stroke is made with a free arm motion keeping the gun

Editor's Note:

The studies on the most effective use of paint materials were conducted in the Headquarters Manufacturing Engineering Department Laboratories by Mr. Strom under the direction of J. B. Dym, section engineer.

The laboratories and personnel of the department are at the service of the Westinghouse operating divisions on problems relating to painting or other manufacturing operations. C. G. Wallis is manager of the Department, and W. H. Dickinson is director of the Laboratories.

parallel to the surface. Begin the stroke before the trigger is pulled and release the trigger immediately before ending the stroke. The spraying speed depends on the material being sprayed, rate of flow and surface being coated. Make adjustments for maximum speed consistent with the operator's ability to handle the gun and the finish desired.

The spray gun is a precision-made tool which should not be abused by rough and careless handling. If it is kept clean, it is very seldom necessary to take it apart except for the replacement of worn or damaged parts. The complete gun should never be soaked in thinners or caustic alkaline cleaners. The former destroy the fluid needle packing and gaskets, and the latter attack the aluminum alloy in the gun body and parts.

Troubles and remedies*

What causes fluid leakage from fluid needle packing nut?

Loose packing nut or dry fluid

*From The DeVilbiss Company's "ABC of Spray Painting Equipment",

needle packing. Remove and soften packing with a few drops of light oil and replace. Tighten packing nut to prevent leakage but not so tight as to grip fluid needle.

What causes air leakage from front of gun?

Air valve not seating properly—due to: foreign matter on valve or seat; worn or damaged valve or seat; broken air valve spring; sticking valve stem due to lack of lubrication; bent valve stem; packing nut too tight.

What causes fluid leakage from front of gun?

Fluid needle not seating properly—due to: worn or damaged fluid tip or needle; lumps or dirt lodged in fluid tip; packing nut too tight; broken fluid needle spring; wrong needle size.

What causes a jerky or fluttering spray?

Air leakage into fluid line—due to (applying to pressure or suction feed): lack of sufficient material in container; tipping container at acute angle; obstructed fluid passage way; loose or cracked fluid tube in cup; loose fluid or damage tip seat—and (applying to suction feed only): too heavy material for suction feed; clogged air vent in cup lid; loose, dirty or damaged coupling nut on cup lid; loose fluid needle packing nut; fluid tube resting on bottom of cup.

What causes defective spray patterns?

1. Heavy top pattern—due to: horn holes partially plugged; obstruction on top of fluid tip; dirt on air cap seat or fluid tip seat.

2. Heavy bottom pattern—due to: horn holes partially plugged; obstruction on bottom side of fluid tip; dirt on air cap seat or fluid tip seat.

3. Heavy right side pattern—due to: right side of horn holes partially clogged; dirt on right side of fluid tip; on twin jet cap, right jet clogged.

4. Heavy left side pattern—due to: left side of horn holes partially clogged; dirt on left side of fluid tip; on twin jet cap, left jet clogged.

5. Heavy center pattern—due to: too low a setting of spreader adjustment valve; with twin jet cap, too

to Page 57 →



**Use the right
FOUNDATION
for durability**

PERMANENT bridges require a strong, structurally sound foundation. Permanent porcelain enamel finishes require "the right foundation" too, and that means the right ground coat — one that has the adherence or "grip" to insure a strong, everlasting bond between the cover coat enamel and the metal base.

Century makes cover coats — in fact, a complete line of enamels for all production work on steel or cast iron. But we say first "start right from the steel out" by using Century ground coats, regardless of the cover coats you use. Use the ground coat enamels that are economical to buy and easy to work in the enameling plant, and that give everlasting protection to your products in the field.

Some of the country's largest production plants, and small plants too, have used many millions of pounds of Century ground coat enamels, and swear by them after years of use. New customers are just as enthusiastic. Try Century ground coats and you will be a booster too.



CENTURY VITREOUS ENAMEL COMPANY

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The importance of demineralized water

first in a series of articles on how appliance-producing plants can reduce finishing department costs through the use of chemically-pure water

FACED with rising costs for manpower and materials, and with keen competition for the consumer's dollar in the durable goods field, manufacturers of home appliances are seeking production economies which can be achieved immediately.

During the seller's market which existed for three years after World War II, and again briefly following the outbreak of the Korean War, plants weren't too concerned with rework or reject problems. Full production was the object of plant managers. Rejects were either scrapped or returned to the production line for costly rework.

But today rejects are taboo. It's up to the cleaning and finishing departments to produce ware with a uniform appearance, and with an absolute minimum of rework. Cost-reduction programs in effect today have no place in the ledger for overhead due to large scrap piles.

Therefore, it's up to cleaning and finishing foremen to produce the best ware their departments can turn out. And more and more finishing men are discovering that the use of demineralized (also called deionized) water can aid in reducing the amount of defective ware attributed to their departments.

All raw water supplies — whether from lakes, rivers or wells — contain chemical impurities which may cause no difficulty in many industrial processes. For other uses, especially in the finishing departments, certain characteristics of raw water are detrimental.

Distilled water would be the answer to many finishing room problems — if it were not for the cost. But demineralized water, which approaches

distilled water in purity, will serve the same purpose.

For the cleaning room

The significance of hard water on costs is felt immediately in the cleaning room where the metal must be cleaned prior to enameling, painting,

Editor's Note:

This opening article on the use of demineralized water in appliance plants contains some background information to acquaint finishing and cleaning department foremen and supervisors with the danger that may exist in the use of raw water for finishing operations.

More detailed information can be found in previous articles in *finish*, including "Deionized Water for War Plants and the Ceramic Finishing Field," March, 1944, and "The Significance of Water in Industrial Processes," March, 1950.

plating, polishing, or whatever finishing operation is employed.

It is a known fact that it takes more cleaning compound to clean metal if hard water is used in the process. Also, the precipitate formed by the hardness and the cleaning compounds tends to cling to the ware, necessitating longer cleaning operations. And even with longer cleaning, traces of the precipitate may cling to the work and cause rejects in the finished ware.

The use of new synthetic resins in industrial coatings, especially the chemically-resistant plastic type, has made the painting departments cognizant of the acute problem of proper preparation of the metal surface. Here the use of demineralized water can play an important part.

Other important applications

One department in porcelain enam-

el plants which can use demineralized water to advantage is the mill room. It is true that adjustments can be made in the mill batches for the dissolved solids found in raw water. However, changes in water supply necessitates adjustments in milling operations. The use of demineralized water assures a water of the same composition regardless of variations in the raw water supply.

Also, the use of chemically-pure water in enamel slip has been found in some cases to reduce rejects due to copperheading, a phenomenon often attributed to the reaction of water impurities on metal during firing.

Chemically-free water can also be used to advantage in the polishing of aluminum parts, especially where the raw water supply contains calcium salts which have a corrosive effect on aluminum surfaces. This is also true for quenching aluminum after heat treating — if raw water containing calcium is used in the quenching operation.

Costly buffing operations to remove water spots prior to plating can be eliminated if pure water is used instead of raw water in the cleaning room.

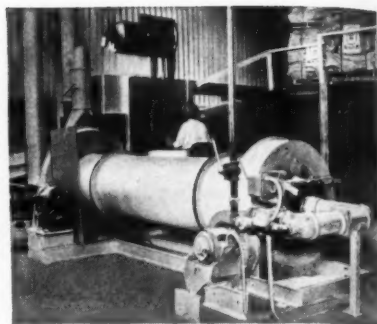
Also, a side-line saving can be achieved in maintenance costs, as chemically free water will reduce scale formation in pipe lines and water storage tanks. (Some plants have found that scale from rusted pipes can cause serious trouble in the finishing departments.)

Specific examples of how appliance manufacturing plants are benefitting from the use of demineralized water will be presented in a series of case histories beginning with the September issue of *finish*.

Improved High-Temperature Furnace



← **WELDING INCONEL** feeder spirals to inner Inconel shell of a perlite expansion furnace. This shell, in which the mineral is pre-heated and then "popped" at temperatures ranging to 2000° F., is suspended only at the ends, and rotates constantly. Use of Inconel minimizes sagging, reduces crust formation, scaling and abrasion, and provides rapid heat transfer. → Furnace in operation, with raw ore being dropped into burner flame. Illustrations by courtesy of The Perlite Corporation, Lansdowne, Pa.



Boosts Production of the "CINDERELLA MINERAL"

Twelve years ago, it was commercially unknown.

Today, there's a demand for more than 18 million cubic feet a year. And the limit is nowhere in sight.

That's the Cinderella story of perlite, a glassy volcanic mineral found in the Rocky Mountains.

First used in place of sand as a concrete and plaster aggregate, perlite has now proved its value in many other fields. It is used in drilling muds and oil well cements...as a filler in plastics and resins...even as packing material for fragile merchandise.

In theory, the processing of perlite is fairly simple. You crush the mined or quarried ore (which is nearly 75% silica), and then heat it to a high temperature. Entrapped water vaporizes, and the ore pops like corn, expanding to 10 times its original volume.

There's the finished product! And many times, too, the processors of perlite also look at a "finished" furnace. For processing temperatures that sometimes exceed 2000° F. play hob with ceramic linings. Heating and cooling bring on spalling. Even the rough ore particles themselves do plenty of damage.

As production demands soared, a way had to be found to beat these furnace problems. And it was—with Inconel®, the high-temperature alloy so widely used in jet-engine combustion chambers and metal heat-treating equipment.

Long known as one of the most durable high-temperature metals, Inconel resists wear and abrasion. It helps protect product purity. It reduces clinker formation...scaling...buckling...corrosion. In perlite furnaces, Inconel promises a service life up to 5 times that of firebrick.

Right now, Inconel is on extended delivery because so much is needed for defense. But if you have any type of metal-failure problem, Inco's High-Temperature Engineers may be able to help you. Write us for your copy of the "High-Temperature Work Sheet," a simplified form on which to describe your problem. No obligation.

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Enameling of aluminum

description of processes and controls employed in the production of Zourite architectural store front panels

by C. R. Sigler • PROCESS & MATERIALS ENGINEER, THE KAWNEER COMPANY, NILES, MICHIGAN

IN the late 1930's, when the building industry had generally accepted the metal store front design, our company recognized a need for a colored material to lend variety and spice to our line of architectural products.

Our first step toward supplying a colored store front material then was to include in our line a porcelain-on-steel product of the pan design. This product required that each store front be custom-designed and manufactured.

However, about 1940 we began a stock size — stocked parts program. The pan design did not fit into this program and soon gave way to our new Zourite line.

Zourite was an entirely new concept in store front facia design and construction. This line of mouldings lends itself to field fabrication. They can be applied to any store front with a minimum of cutting. Adoption of this new line by Kawneer meant eliminating the custom-designing of each front, reduction in installation costs, and the mouldings could be carried in stock by our distributors through the country for immediate use.

Convinced that our Zourite line was the most practical product for store front facia, and searching for a color process for aluminum Zourite we began work on a porcelain enameling process still in the early laboratory stages at the DuPont Company (see "Vitreous Enamels for Aluminum", first comprehensive official release of technical data on this subject, January and February 1949 finish).

We made some test runs to provide

some samples for laboratory and field tests. The lab tests gave some fine ratings to the new product as compared to organic finishes. Without being able to correlate exactly the lab results with actual wearing and weathering performance, since the product was brand new, the company began its pilot operation.

The equipment we put into operation was (1) a standard 24-foot spray booth, (2) a converted horizontal heat treat furnace, electrically fired, 17 feet long, and (3) two ball mills of 100 lb. total charge each. In order to continue our stocked parts program we received from our architectural group three colors which were to be standard.

We had practically arrived at our goal — that is, a colored aluminum facia material with the following advantages:

1. Excellent weathering properties
2. Easy low-cost installation
3. A universally applied product
4. A coating flexible enough to allow minor forming to various job conditions
5. Light weight construction requiring no structural changes in the building
6. Low maintenance cost to the store owner
7. High impact and thermal shock resistance
8. Chipping without further corrosion or staining.

Today we are using the same equipment with which we started operations, streamlined of course to better suit the operation as we recognized the need for changes.

The operation is still a pilot operation

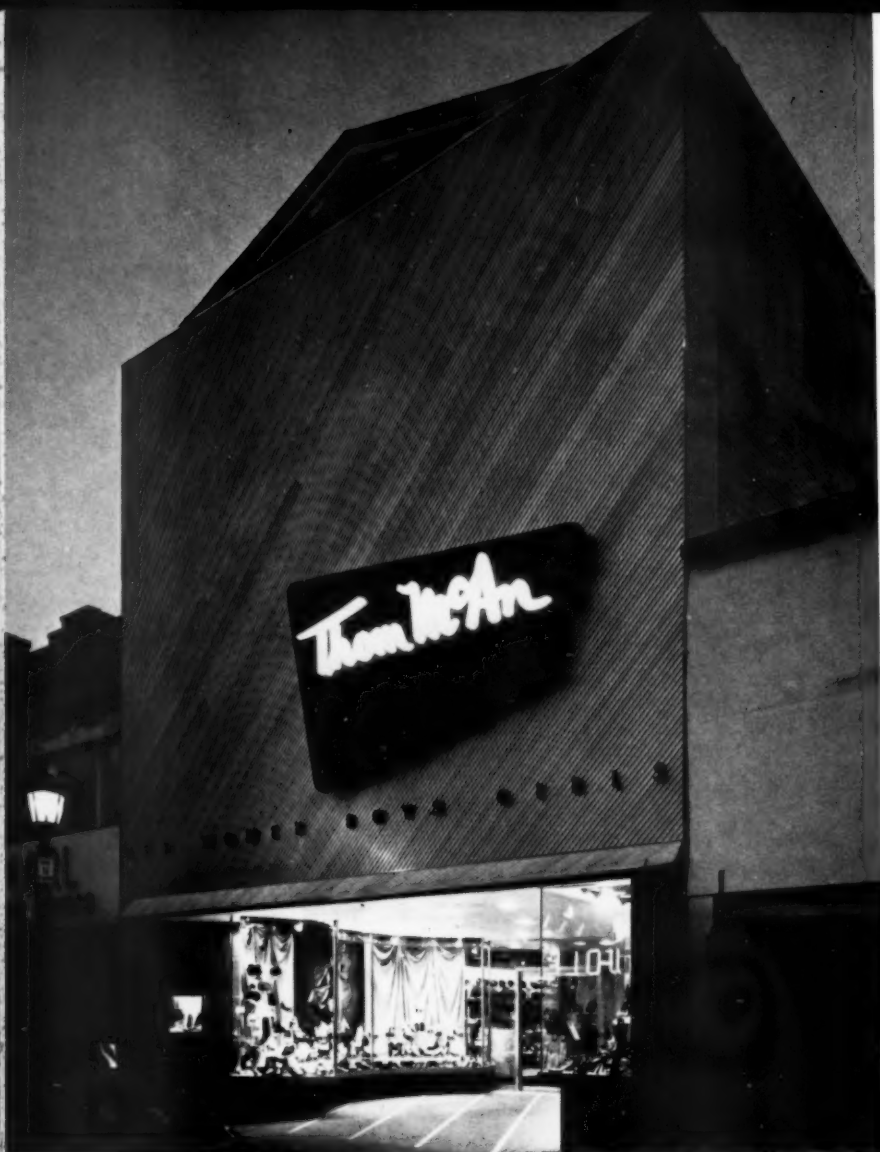
in the sense that production is directed by myself as process and materials engineer. However, our production rate the first seven months of 1951 was 100,000 sq. ft., or 175,000 sq. ft. per year. The product is well entrenched as an important part of our line of products. Consideration has been given to modernizing our equipment and facilities toward the end of easier quality control and a lower cost product.

Our process is devoted entirely to the application of porcelain enamel to standard shapes, which are cold rolled formed from 61S aluminum coiled sheet. This article will be confined to just this operation. The processing of the formed piece can be broken down into six units. They are:

1. Treating the metal.
2. Milling the enamel.
3. Spraying.
4. Firing.
5. Testing and inspection.
6. Rerolling.

C. R. SIGLER





Zourite forms a striking diagonal pattern on the facade of this store located in Hempstead, Long Island. Architect was Lester Tichy.

Absolute control in each of these six phases is critical to the successful manufacture of enameled aluminum ware. Our operation is controlled to much closer ranges and operating conditions than those set forth in DuPont's Bulletin No. 31.

Treatment of the metal

This phase of the operation is the most critical and more important to the success of the applied product than any other.

We begin by vapor degreasing the parts to remove the oil accumulated during roll forming. Here good degreasing practice has been necessary; that is, the material must be allowed to remain in the vapor until no further condensation is present on

the surface. This requires about 10 minutes.

Following the degrease, the work is placed for 15 minutes in a 6% sulfuric acid solution at room temperature and containing 1/2% wetting agent. The purpose of this bath is to remove dirt, oxides and other foreign matter not affected by the degreaser. When the metal leaves this tank it must be thoroughly clean since the subsequent pre-treatment bath can only work effectively and uniformly on a surface completely free of grease, oil, and oxide. One of our early mistakes was to discount the importance of this operation.

On leaving the acid solution the material must be thoroughly rinsed and drained.

The final step is the caustic-chrome pre-treatment. The solution is made up of the following per gallon:

- .02 lbs. Chromic sulfate
- 1.00 lbs. Chromic acid
- 1.19 lbs. Sodium hydroxide
- 8.00 lbs. Water

Here we have found the need for much closer control than indicated in DuPont's bulletin. Their temperature recommendation is 120°F. \pm 5°F. We use 116°F \pm 2°. Their time element is 4 minutes \pm 1 minute. Our operation is held as close as possible to 4 minutes \pm 0. The DuPont's bulletin. Their temperature, and the length of dip have each been found to be extremely important. Absolute control on this treatment is essential. The action of the solution continues even after the work leaves the tank and until it is immersed in the rinse water again. Therefore, the 4 minutes should include the transfer time. Once out of the rinse tank the material must be spray rinsed until all traces of the yellow-chrome color have been washed away.

Once the work has air dried, it is placed on the rack trucks and placed in the furnace at 1000°F for 5 minutes plus the time necessary for the furnace to recover to 1000°F.

Earlier I mentioned the critical nature of the pre-treating cycle. Here the bond between the enamel and aluminum is being established. Any error in the operation will result in flaking off of the enamel either immediately after firing or eventually on the job site. We experienced this in the early days before we had established our present limits and controls on the cycle.

Milling the enamel

The enamel is made up of: (1) a lead base frit, (2) the mill agent, (3) oxides, and (4) water.

We have two jar mills of 100 lbs. total-charge capacity and one mill of 200 lbs. total-charge capacity. These are charged in the usual manner using gram weights on the oxides to obtain the best color match. The mills grind for 6 hours to achieve the desired texture. The grinding is considered complete when less than .2 gram from a 50 cc. sample is re-

tained on a 325 mesh screen. The slip is then weighed out to a specific gravity of 2.0 in preparation for spraying.

Spraying

Our spray equipment consists of a conventional spray booth with a tilted table for holding the work, a 10-gallon pressure pot with an agitator, and a low pressure spray system and guns. The air lines have filters and regulating valves necessary for good control of the air. Our spraying is all done by hand. The operator walks forward and backward along the 16-foot piece spraying continuously for the length of the piece. The gun is stopped and started at the end of the piece before the return trip is made.

The ground coat is applied to both sides of the piece. Each side requires that the operator make two round trips or four passes with the gun. On each pass the angle of the gun with respect to the work is varied in order to give uniform coverage to all surfaces. The enamel is applied about 15 grams of dry ingredients per square foot.

Following the firing of the ground coat and cooling of the material, the

first cover coat is applied. The cover coats are only applied to the face of the moulding. The contour of the moulding with the sharp reverse corners makes the two-coat process necessary. The first cover coat then is applied in the same manner as the ground coat on the face side using four passes. About 15 to 20 grams is applied per square foot. Particular care is given on the first coat to coverage on the sloping elements of the contour. Again the work is fired and cooled.

The second cover coat is sprayed in an entirely different manner than the two previous coats. Here, the six passes are used to insure an overall smooth wet spray. About 20 grams per square foot is applied.

Firing

In the process of enameling aluminum the piece is fired four times. Once following the pre-treatment and then after each of the three enamel applications. The furnace we use is a converted heat treat furnace. It has a work area 17' x 3 1/2' x 3 1/2'. It is electrically fired with the elements along the side walls, the doors, and the bottom. There is a brick lining on all sides to form the insula-

tion. Because of the brick dust, the recirculating system on the furnace originally was removed. We now use it as a dead air unit to prevent the blowing of brick dust and other foreign particles on the enamel during firing.

The heating elements are divided into three zones longitudinally. Each zone is equipped with automatic input controllers and recorders. Because the unit is dead air it was a tough trial and error method of establishing the placement of the elements, the zone division, and the settings on the controllers to eliminate as nearly as possible the hot and cold spots. Through these trials we now have only about 15° F variation throughout the box. This meets our requirements.

The furnace is set at 1000°F, which is only about 200° under the melting point of the metal. The load entering the furnace causes the temperature to drop about 200°. The firing time includes about 10 minutes furnace recovery time plus a 5 minute soak period on pre-heat and 8 minute soak on each of the enamel firings.

The work is held on rack trucks
to Page 56 →

This store with Zourite facade is located in New York City. Architect was J. Gordon Carr.





MAC DRAW NO. 8*

**helps produce millions of 20 mm
cartridge cases—from cup to case**

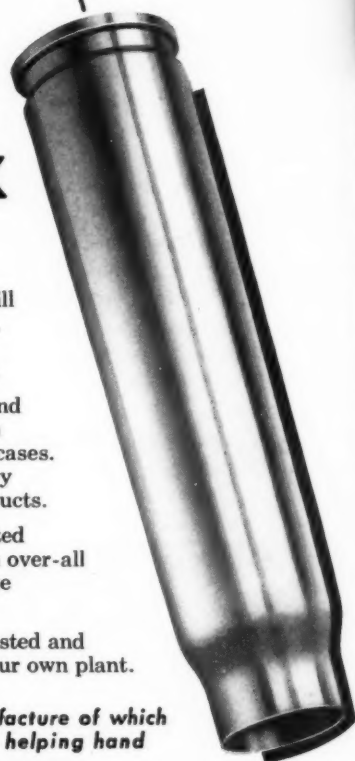
WITHOUT DIE RE-WORK

To date, actual plant test shows more than 11,000,000 20mm cartridge cases completely finished without die re-working on any of the five separate drawing operations involved—and still going strong. No telling how high the number will ultimately go. This amazing feat is being accomplished by a large Mid-west manufacturer† through the use of our famous Mac Draw No. 8.

This Special Brass Drawing Oil, engineered for fast, accurate and uniform drawing with maximum lubrication for greater long-run die endurance, is doing a perfect job in the production of these cases. The Macco Company takes justifiable pride in this extraordinary record, as it does in the all-around perfection of each of its products.

Mac Draw No. 8 is only one of the many Macco Big 4 Pre-Tested chemical compounds and cutting oils that are today giving such over-all satisfaction in many of the country's leading civilian and defense steel production industries.

When you specify Macco, you know you are getting products tested and proved, under the same actual working conditions existing in your own plant.



*Here are a few of the many items in the manufacture of which
Macco "Know-How" is lending a powerful helping hand*

Shells, Projectiles, Rockets—
all sizes.

Cartridge Cases—from 50mm to
155mm, steel and brass.

Tank Tread Connectors.
Blitz Cans.

Screw Machine Products.

Jet Engine Parts.

Bazooka Shells.

Fuses.

Tank Parts—Transmissions, Axles,
Differentials.

† Manufacturer's name
and actual case his-
tories of many other
satisfied users of
Macco Products fur-
nished on request.

** Mac Draw No. 8 was used on every operation, including Heading, Trimming,
Tapering, Shaving, etc., without extra washing. Comes off clean in hot water.*

MACCO
PRODUCTS COMPANY

CHEMICAL COMPOUNDS

Write Direct or Contact a Macco
Representative Today

FOR THE METAL WORKING TRADE--SINCE 1931

525 W. 76th STREET ★ CHICAGO 20, ILL.

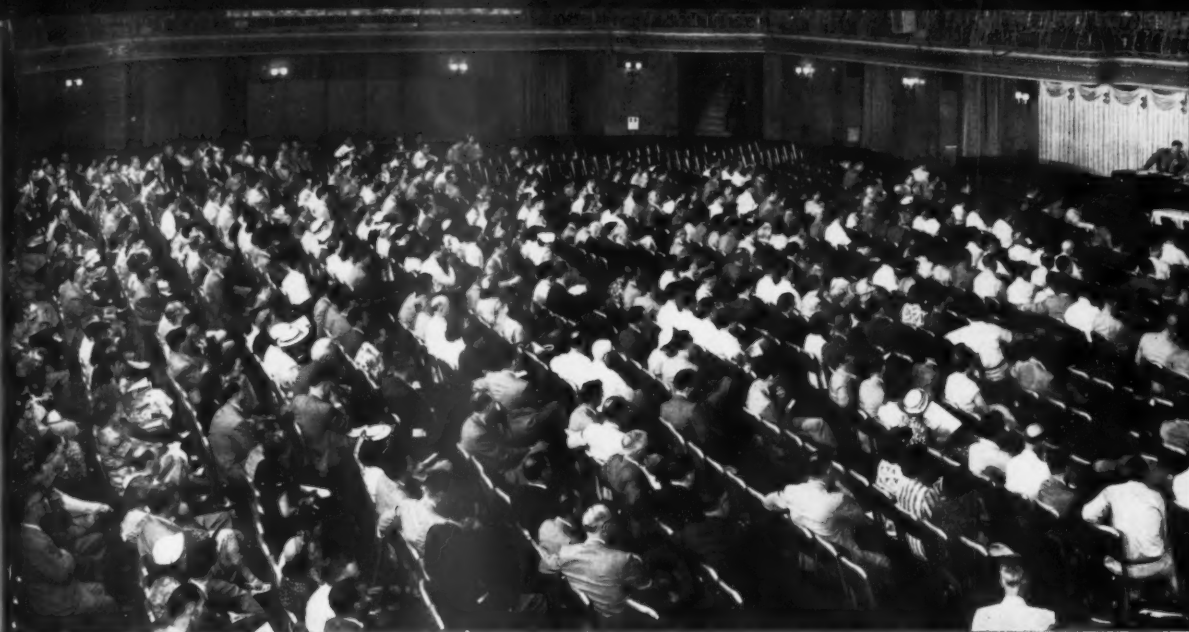


Photo taken during an AES technical session held at Conrad Hilton Hotel.

AES holds 39th annual meeting

11,000 attend concurrent Industrial Finishing Exposition

THE 3rd Industrial Finishing Exposition, held June 16 to 19 at the Amphitheatre, Chicago, drew an attendance of 11,000 persons. The show was sponsored by the American Electroplaters Society in conjunction with the AES 39th annual meeting.

For the first time manufacturers of paints, lacquer, enamels, spray finishing equipment, ovens, industrial tapes, and temperature controls were included in the exhibits. Previously exhibits had been limited to base metals and chemicals, plating, polishing and buffing equipment and associated products. Over 120 new products used by metal finishing departments were shown by the various exhibitors.

Approximately 1700 persons attended the AES technical sessions held at the Conrad Hilton Hotel. Some 18 papers were presented by well-known industry men. A highlight of the session was the presentation of a colored movie which took those in attendance on a "tour" of the electroplating projects laboratories of Westinghouse Electric Corp.

MacStoker named AES president

F. J. MacStoker, superintendent of finish **AUGUST • 1952**

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Other new officers include: 1st vice pres., George P. Swift, electroplating consultant, Watertown, Mass.; 2nd vice pres., Ralph A. Schaefer, di-

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finishfotos from exposition

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Clyde Kelly, left, receiving "Electroplating's Man of the Year" from Carl F. Hansen, chairman, Chicago Electro-Platers Ins





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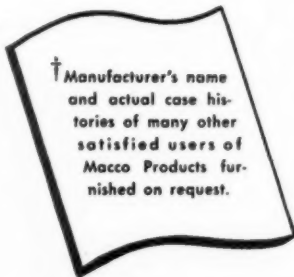
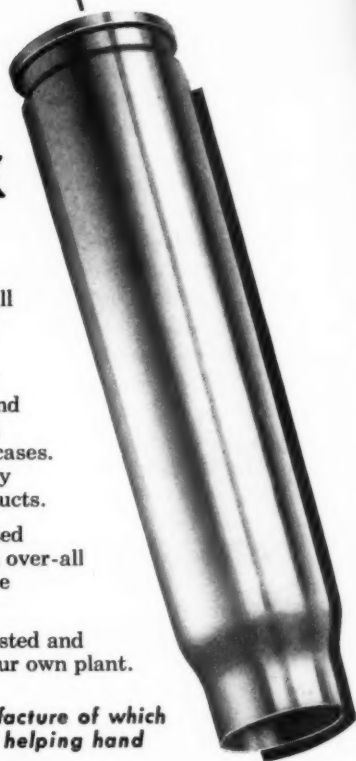
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† Manufacturer's name and actual case histories of many other satisfied users of Macco Products furnished on request.

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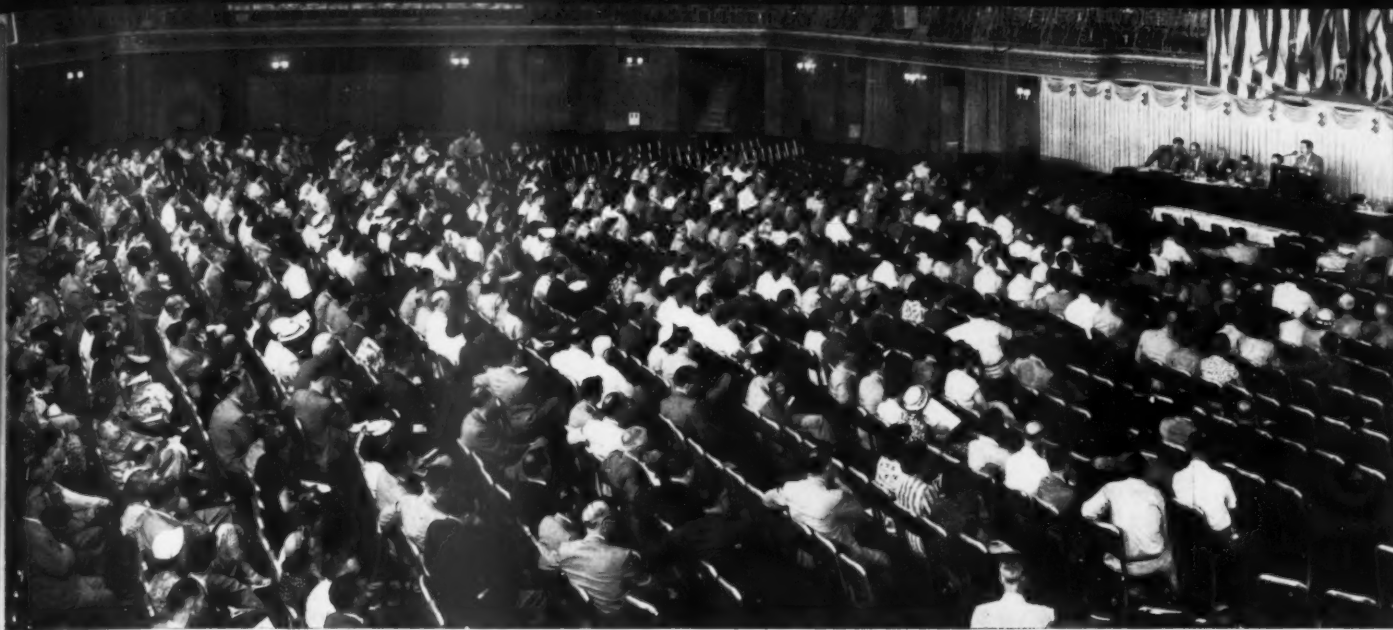


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Clyde Kelly, left, receiving "Electroplating's Man of the Year" award from Carl F. Hansen, chairman, Chicago Electro-Platers Institute.





In booth of Industrial Filter & Pump were Harold Faint, left, of Industrial Filter, and Walter Binai, an Indianapolis distributor.



Geo. Hanley, Ardco, Leon Friedman, Nat'l Aluminum; Hubert Goldman, Robt. Goodsell, Enthone; Thos. Davy, Ardco; C. C. Helmle, Enthone.

SNAPSHOTS FROM 1952 F



This trio visited Queen Stove Works Almco Division booth. On right is W. A. Irvine, of Maytag.



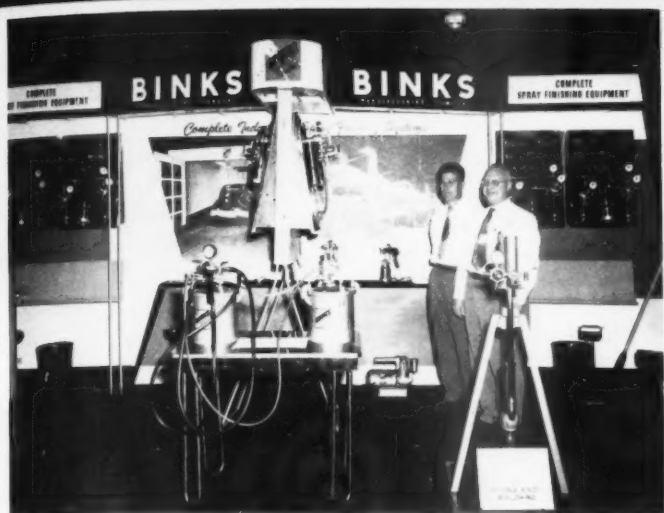
Photographer snapped this crowd in the Oakite booth. Exhibitors stated that attendance at exposition was excellent.

finishfotos

In Wiegand booth: John Malmrose, Kewanee Mfg.; David Sloan, Court Radiator (Canada); H. W. McElhaney, Talon; W. O. Thompson, Wiegand.



Ransburg's exhibit stopped this crowd with demonstration of coating washing machine tubs without any paint overspray.



On hand to discuss spray finishing with exposition visitors were Tom Burns and R. W. Plutz, of Binks Manufacturing.



LeRoy Camel (left), and W. F. Lucas (right), both of Detrex, discuss finishing problems with Chas. Levý, of U.S. Army Waterton Arsenal.

2 FINISHING EXPOSITION



Fred Folsom, of Chicago office of Harshaw Chemical, with Max Willemis, of Electrofilm Corp., North Hollywood, Calif.



In Mystic Tape booth were Tom Armstrong, of Mystic; H. Telljors, of Pabisch Mfg., and James Elliott, Mystic.

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Trio on right in Parker Rustproof booth consisted of Ed. Thompson, Parker; Gene Kinelski and C. O. Stevens, Pullman Standard Car Mfg.



In Turco Products booth were Tom Boland and Archie Beard, both from Turco's Chicago office.



An additional editorial board of producers of

To Finish:

It certainly would be of great value to the homemaker to be able to purchase major kitchen and laundry appliances in a standardized white. It would make for more attractive kitchens and laundries, whether the home owner was starting from scratch with new appliances, or adding to existing ones.

It is difficult, I know, for manufacturers to achieve this, even within their own lines, but you will be doing a great service for both the home owner and the industry in your efforts to get manufacturers to unify the color of major equipment.

Hildegarde Popper
Household Equipment Editor

Pemco Corporation

To Finish:

Several members of our organization have commented very favorably on your editorial campaign for the standardization of white finishes as used on home appliances. The subject is dear to the hearts of all of us and we hope *finish* magazine can sell the idea to the appliance industry. It is certainly well worth a good try.

... The heart of low cost, high quality, large volume production is standardization. This goes for colors as well as any other phase in the manufacturing process. This was probably what was at the back of Henry Ford's mind when he said, years ago, that his customers could have any color they wanted as long as it was black. If the appliance industry could adopt the same motto with respect to white, they would get rid of a lot of headaches in the way of new and replacement color matching problems, and their attendant production and distribution costs. . . .

Charles P. Lohman
Sales Manager

Editor's Note:

The *Finish Line* editorial for April raised these questions: (1) should white for metal products—particularly appliances for kitchen and laundry—be standardized, and (2) is there a technical and practical solution to the question of standardizing white finishes?

In May and June, *Finish* presented the opinions of 13 leading editors, all pointing to the desirability of standardizing white for home appliances.

On these pages you may read similar expressions of opinion by an additional editor, and three manufacturers of porcelain/enamel. Opinions of organic finish producers and appliance manufacturers will appear later.

As explained in our opening editorial, *finish* will publish opinions and comments from all sources, and act as a "sounding board" for the technical progress and practical achievements relating to the subject.

In future issues, we shall plan to present opinions of additional manufacturers and manufacturers' cooperative organizations on this subject, as well as reports of constructive work in progress.

THE
finish

HOW WHITE IS WHITE? — is a tough way of stating a question that has been nagging consumers for years. The producers of all types of finished, finished, the manufacturers of all kinds of finished, finished products and the consumers of all kinds of finished, finished products for a good many years.

To state the standpoint was not for metal appliances entering the market that the standard time for a specific

...and practical problem
If we start a discussion of the technical pro-
... we would be using such terms as: spectro-
... reflectometer, diffuse and specular reflection,
... hue, value, chroma and other technical
... that are important to the technician and
... need not be included in a strictly "practi-
... cally oriented" text.

We have received inquiries at *Smith* from companies large and small, concerning an existing source for a standard white plastic individual finished product manufacturers could invariably use for their own benefit and for the benefit of the final customer.

These inquiries raise two questions: (1) should white for metal surfaces—particularly appliances for kitchen and bathroom—be standardized, and (2) is there a technical and practical solution to the question of standard color differences?

...for every... for standard...
and knowledge... the question...
...should seek general solution to the...
...using which...?

...In our opinion, it should be possible to come up with
an affirmative answer for both of the questions. However
we are not completely interested in our opinion. We are
interested in examining the degree of interest in the
problem, the possibility of getting action, and the chances
English comp. - ...

for cooperation among metal products manufacturers, particularly those making major appliances.

particularly the
study has been done
to be remi

We would be remiss if we failed to report the fact that much of the progress has been done by important technical men in the machine tool and machine tool field over a period of years.

Some cooperative work has been carried out during recent years by technical representatives of both organic producers and from the suppliers of both organic finishes.

The National Electrical Manufacturers Association has a "Joint Sections Committee on Color of Kitchens Appliances" which has held productive meetings and appears to be nearing an approach to the problem.

Another opportunity for cooperation

technical problems as spectro-radiation reflectance, and other technical problems that require a technician and relatively "practical" solutions.

We will make the new eminently practical connection with the new cooperative Transit Program when the cooperative is suggested by finish. We will help by offering an sounding board for ideas and opinions and for promoting a standardization if and when it is proved to be desired and practical.

Questions: (1) should white
kitchen appliances for kitchen
(2) is there a tech-
standard

...it be possible to come up with
...questions. How

...both of the questions. We
interested in our opinions. We
...the degree of interest in the
...for getting action, and the chance

Dana Chase
EDITOR AND PUBLISHER

How White is White?

Opinion and letters from three of the
enamel finishes

Chicago Vitreous Enamel Product Co.

To Finish:

I have read with considerable interest your recent editorial on "How White is White." Let me congratulate you on a very constructive idea.

As you know, there have been many changes in the shades of white used on appliances over the years. If standardization of white were in existence today, all manufacturers could be using the same pleasing shade. Instead, however, one need only visit an appliance store to see the wide variation that now exists from product to product.

Standardization of white in both the organic and inorganic finishes would do much to simplify the production and assembly operations. In addition, it would solve a problem that faces every manufacturer . . . the problem of supplying replacement parts in the proper shade to match original products. In many cases, the shipment of a replacement part that has not matched the original product has caused both dealer and customer dissatisfaction, and has cost the manufacturer a great deal of time, trouble and expense which standardization of white would completely eliminate.

Since most appliances are purchased one product at a time and, in many cases, each may be from a different manufacturer, the chances of achieving uniformity of white are slim. Standardization of white would make it possible for consumers to achieve the uniformly beautiful effect that is now possible only when appliances and cabinets are purchased from one manufacturing source who may or may not maintain uniform white color on all his products. . . .

Wm. Hogenson
President

Ingram-Richardson, Inc.

To Finish:

The editorial comments in the May and June issues of *finish* magazine have been reviewed carefully, and we note that everyone is pretty much in accord with the desirability of standardizing white enamel finishes for all types of appliances.

Of course, no one can dispute the fact that this would be representing the ultimate, and that there would be many advantages throughout the trade. We, as a frit manufacturer as well as a job enameler and producer of certain kitchen units, know that such a step would be a major undertaking. We recognize that even within our own plant using the same enamels and firing conditions it is difficult to maintain the same shades of white on the same parts—and particularly on different parts, such as might be required on a stove. We, likewise, cannot help but think of the same variations that exist from plant to plant even where the same enamels are used but under different conditions.

When this line of thinking reaches out to include painted appliances, we can readily see that the problems begin to multiply. We know there are other factors that probably enter into the variation of shade, such as the base metal on which it is to be applied, etc. . . .

Our experience here at this point as well as in the field with our frit activities naturally can only lead to a rather pessimistic view as to the various difficulties that would seem to make the standardization of whites very impractical. *On the other hand, if there is some yardstick or measurement that can be established, it might be rather surprising what the various industries could do toward at least eliminating the wide range of shades that are so obvious today.*

We here at this point do recognize the fact that, as a frit manufacturer, we should not take a pessimistic viewpoint and should get over on the other side and be more optimistic on the basis that probably the matter should be handled with progressive steps . . . the first step would be to arrive at some shade of white and determine its characteristics by a certain standard and then let everyone concerned try to make that shade their goal. . . .

Needless to say, we are quite willing to cooperate to the fullest extent possible.

R. H. Coin
President

What the metals & enameling industries should know about ASTM & Committee C-22

by *M. Bozsin* • FERRO CORPORATION; MEMBER OF EDUCATIONAL GROUP FOR COMMITTEE C-22

THE American Society for Testing Materials with headquarters in Philadelphia, Pa., has an active Committee C-22 on porcelain enamels which was organized about two years ago. Many enamelers do not know about the work of this Committee and its value to the industry as a whole; therefore the following pertinent points should be of interest.

The American Society for Testing Materials was established in 1902 with a membership of 70. The purpose was "The promotion of knowledge of the materials of engineering, and the standardization of specifications and methods of testing." Since, ASTM has grown to a current membership of over 7200. There are now 74 technical committees which comprise a membership of some 3000, eliminating duplications.

Scope of C-22

The scope of Committee C-22 on Porcelain Enamel is the stimulation of research and the formulation of definitions, methods of test, and specifications pertaining to porcelain enamel, ceramic and ceramic-metal coatings for metals.

The officers are: Chairman, W. N. Harrison, National Bureau of Standards; Vice Chairman, D. G. Bennett, Department of Ceramic Engineering, University of Illinois; Secretary, G. H. Spencer-Strong, Pemco Corporation.

This Committee is composed of 32 members, comprising producers, consumers and general interest representation. Practically every type of organization is represented on C-22, but producers, consumers, and general interest are kept at pre-determined levels, so that over-balance of either will not predominate.

Formal meetings are held two or three times a year, but in the interim there is accomplished a great deal of correspondence, cooperative testing programs, and collecting of data for formal discussions.

Committee C-22 is divided into three subcommittees:

- I. Research
- II. Nomenclature
- III. Test Methods of Specifications

In subcommittee III, three sections are in operation:

- Section 1. Raw Materials
- Section 2. Material in Process
- Section 3. Finished Products

Members of these subcommittees are: engineers, scientists, educators, testing and research workers.

ASTM membership is open to those interested in the purpose and work of the Society, and can be held by individuals, companies, associations, laboratories, governmental agencies, universities and libraries.

Prepared tests are thoroughly discussed at Committee meetings and are voted on by letter ballot. The varied interest represented in these committees make certain that all tests prior to acceptance have been investigated and are made to serve a definite purpose. These tests must be passed by the Committee and approved by the Society at a national meeting of the Administrative Committee on Standards.

Tentative test methods adopted

During the past two years, since the Committee has been in existence, there have been five tentative tests methods adopted by the Society. These are as follows:

- 1. Tentative Sieve Test for Wet Milled Porcelain Enamel. (C285T)
- 2. Tentative Method of Test for Resist-

ance of Porcelain Enameled Utensils to Boiling Acid. (C283T)

- 3. Tentative Test for Acid Resistance of Porcelain Enamels (Room Temperature Test). (C282T)
- 4. Tentative Method of Test for Impact Resistance of Porcelain Enameled Utensils. (C284T)
- 5. Tentative Definitions of Terms Relating to Porcelain Enamel. (C286T)

Subcommittee I, Research, is investigating thermal shock and short and long term effects of porcelain enamels on the underlying metals at various temperatures.

Subcommittee II, on Nomenclature, is progressing with a complete glossary of porcelain terms.

Subcommittee III is responsible for test methods and specifications. This group of experts, covering various phases of the porcelain enamel industry, propose test methods depending upon the needs existing.

At the last Committee meeting, the following subjects were studied:

- a. Evaluation of Enameling Iron (Sagging Test)
- b. Water for Mill Additions
- c. Consistency of Enamel Slips
- d. Torsion Test
- e. Fusion Flow
- f. Evaluation of Set of Clay
- g. Tearing Test
- h. Thickness Test
- i. Thermal Shock Test
- j. Tests for Chemical Ware
- k. Scratch Test
- l. Continuity of Coating Test
- m. Metal Marking Test

The function of the entire Committee is indeed valuable to the porcelain enamel industry as a whole and to all present or future users of porcelain enamel and ceramic coatings, as standards will be formulated covering the various phase of porcelain enamel technology. This group is well qualified to discuss and evaluate these tests for the benefit of the entire industry.

Other industries have benefited from test methods of this nature, and there is no reason why the porcelain enamel industry cannot do likewise.

NEWS

RICHMOND METAL, TOLEDO DESK JOIN KITCHEN CABINET ASSN.

The Steel Kitchen Cabinet Manufacturers Association has announced the addition of two new member companies, Richmond Metal Mfg. Corp., Philadelphia, Pa., and Toledo Desk & Fixture Corp., Maumee, Ohio.

This gives the new Association a total of 21 member companies, representing a very large proportion of the total capacity of the industry, stated F. E. O'Connor, of Geneva Modern Kitchens, Inc., and chairman of the Association Membership Committee.

HOTPOINT NAME CHANGE

John C. Sharp, president of Hotpoint, Inc., has announced that firm's name has been changed to Hotpoint Company, as a division of General Electric Company, rather than an affiliate as in the past.

Sharp said that the name change will have no effect on the company's operations. Hotpoint will continue to function as an independent company, with its own complement of officers. It will market electric kitchens and laundries through its own established organization of distributors and dealers.

PHILCO PRESIDENT SERVING ON CED BOARD OF TRUSTEES

The election of William Balderson, president of Philco Corporation, to the board of trustees of the Committee for Economic Development

has been announced by Marion B. Folsom, chairman of the national economic research and education organization.

CORY BEGINS PRODUCTION OF ROOM AIR CONDITIONERS

The Fresh'nd Aire Company division of Cory Corporation, Chicago, has begun production of two models of electric air conditioning units which have been extensively field tested during the past few months.

HARVESTER APPOINTS NEW HOME ECONOMICS DIRECTOR

International Harvester Company has announced the appointment of Lillie Mae Houston as director of home economics, succeeding Jeanne Homm. Miss Houston joined I-H in 1949 as district office home economist in Sweetwater, Texas.

WHIRLPOOL NAMES ALEXANDER, JACOMB, KRAUSS TO NEW POSTS

Elisha Gray, president of Whirlpool Corporation, has announced that in view of the growing scope of the company's operations, the board of directors has named Donald W. Alexander, formerly vice president in charge of manufacturing, to the new position of vice president in charge of operations.

Alexander, who joined Whirlpool last October, now has the responsibility for manufacturing operations

in St. Joseph, Michigan, and the coordination of the Clyde (Ohio) facilities with overall company operations.

Following his appointment, Alexander announced that Ted Jacomb would assume duties as director of engineering services for the Clyde Division, and that Otto Krauss would become works manager for the St. Joseph plants.

MCCORD HEADS U. S. RADIATOR

W. C. McCord has been elected president of United States Radiator Corp., and Roland P. Place has been elected chairman of the board. Both posts formerly were held by Wesley J. Peoples, who continues as a director.

COLEMAN UPS MOORE TO MARKET RESEARCH DIRECTOR

J. L. Moore, national sales manager and special representative of the firm in Washington, D.C., has been director of market research for The Coleman Company, Wichita. Moore is active in the Gas Appliance Manufacturers Association, National Warm Air Heating and Air Conditioning Association, and the Institute of Cooking and Heating Appliance Manufacturers.

HEAT TRANSFER FIRM BOUGHT BY DRAYER-HANSON

George J. Morton, president, Drayer-Hanson, Inc., Los Angeles, manufacturers of air conditioning and refrigeration equipment, has announced the purchase of Jackson Engineering Co., Montebello, Calif., producers of aerial coolers and shell and tube heat exchangers.

It was also announced that Gordon M. Jackson has joined Drayer-Hanson as vice president of the industrial division.

LEE FULLER TO GLOBE AMERICAN

Lee Fuller, formerly with Pemco Corporation, has joined the enameling department staff of Globe American Corporation as ceramic engineer.

"KEWANEE-ROSS CORP."

Kewanee Boiler Corp. and Ross Heater & Mfg. Co., Inc., two divisions of American Radiator & Standard

Sanitary Corp., have combined to form a new company known as Kewanee-Ross Corp.

PEMCO JOINS IN BALTIMORE BUSINESS-EDUCATION WEEK



Pemco Corporation, a pioneer manufacturer of porcelain enamel and other ceramic finishes, participated in Baltimore's first business-education course conducted the week of June 15.

Each day was devoted to a special theme. June 16 was "industry day" with a program prepared by a committee headed by Richard H. Turk, Pemco president. The next day was given over to "marketing". Pemco was one of 50 industries which played host to some 800 teachers who voluntarily enrolled in the workshop pro-

gram set up to give the city's teachers greater knowledge and understanding of the basic economy of the community and the nation.

The groups visited Pemco's plant, and were received by Richard Turk, as well as Herbert Turk and W. Russell Greer, vice presidents. Divided into groups of ten, the teachers were shown each phase of Pemco's operations.

Mr. Greer addressed the workshop group on the topic "How American Industry Contributes to the American

Way of Life." Tracing the development of America under the system of free enterprise, he showed how Pemco was an example of this progress, describing the career of Karl Turk, Pemco board chairman, who started to make commercial frit in a small shop in Baltimore, and helped lay the groundwork for an entire industry. Herbert Turk made a similar address that included anecdotes from his boyhood when his father started making commercial frit in their own kitchen.

Following, there was a question-and-answer period which developed interest in Pemco's labor relations, employee benefits and pension plans as well as the nature of porcelain enamel, its characteristics and advantages and the vital role it is playing in industry and in the home.

A similar workshop program is being planned for the week of August 25 at which time several hundred other public, parochial and private school teachers will become students to study their city's industrial life.

WHIRLPOOL TRANSFERS WRINGER WASHERS TO CLYDE

The last conventional washer made at Whirlpool Corporation's Plant No. 1, in St. Joseph, Michigan, came off the line on June 27, climaxing 41 years in which the wringer models were manufactured in that plant. The assembly is being transferred to the company's new Clyde Division, in Clyde, Ohio. The space formerly given over to the manufacture of the conventional units will now be used for expanded production of automatic washers and dryers.

NEW MONARCH SALES REP. DIES

Fred F. Witter, sales representative, New Monarch Machine & Stamping Co., Des Moines, Iowa, died June 25.

QUIET-HEET, MILLER METAL, ASTRAL INDUSTRIES JOIN AGA

Quiet-Heet Mfg. Corp., of Newark, N. J., Astral Industries, of Rockleigh, N. J., and Miller Metal Products, Inc., of Baltimore, Md., have joined the American Gas Association, according to an AGA report.

Paint technology course—was presented during the past school year on Friday nights at Saint Joseph's College under the sponsorship of the Philadelphia Paint, Varnish and Lacquer Association and the Philadelphia Federation of Paint and Varnish Production Clubs. Left to right: T. F. Shannon, administrative assistant to college president; G. P. Woodward, chairman of joint educational (tech.) committee of the two paint groups; Beatrice Caniglia, student, receiving a set of Mattiello's "Protective and Decorative Coatings" from Fred Greenawalt, Nuodex Products; and Dr. W. H. Madson, who conducted evening course on "Selected Subjects in Paint Technology."



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it's
time
to
build
or
rebuild



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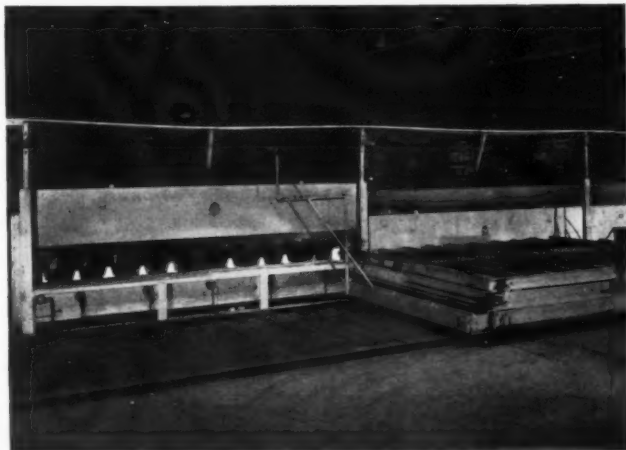
Building a furnace or lining a mill or any other industrial masonry job you can name requires the skill of experienced masons. There just can't be any haphazard guesswork.

For nearly a quarter of a century HUYCK has been called upon to design and build new furnaces, and re-build old ones, to line new mills, or reline old ones.

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AMERICAN-STANDARD V. P. DIES

John C. Reed, 50, vice president in charge of research, American Radiator and Standard Sanitary Corp., Louisville, died June 14.

Reed held important positions in both manufacturing and research operations during his career with American-Standard. The new consolidated plumbing and heating research laboratories soon to be officially opened in Louisville were constructed under his supervision.

WEST COAST ENAMELERS

PLAN MANAGEMENT MEETING

The Pacific Coast Enamelers Club has announced that their next regular meeting will be held Friday, September 19, at the Rodgers Young Auditorium, Los Angeles. This meeting will be of special interest to both management and production personnel, according to Frank W. Fernholtz, Club secretary-treasurer.

HAMILTON NAMES EVANS SENIOR V.P., HALVORSEN SALES V.P.

E. P. Hamilton, president of Hamilton Manufacturing Co., Two Rivers, Wis., has announced the election of Howell G. Evans to the newly-created position of senior vice president.

R. G. Halvorsen, formerly sales manager of the contract-distributor division, succeeds Evans as vice president in charge of sales. He will be

directly responsible to Evans, whose principal duties continue in the sales function of the business but who now will devote more time to long-range sales planning and overall policies.

Evans is treasurer of the American Home Laundry Manufacturers Association, and Halvorsen is a member of the AHLMA executive board and chairman of its dryer products division.

DOUGLAS YODER ELECTED PRESIDENT OF YODER COMPANY

The Yoder Company has announced the election of Douglas O. Yoder as president to succeed John I. Lucas, who retired. Lucas had been with Yoder since 1935, first as sales manager, then as vice president. He was elected president in 1945.

Douglas Yoder started in the factory in 1935, and worked in nearly every department of the company, including production, engineering, sales and advertising. He was in Europe with the U.S. Air Corps from 1942 to 1945. He became assistant to the president in 1949.

Frank R. Sargeant, executive vice president and treasurer, also retired. Edmund H. Kanzenbach, secretary, was named treasurer.

Other officers of the company include: William J. Kerr, vice president of production; Norbert C. Rubin, vice president of sales; Paul Abel,

vice president of engineering; and James Dagleish, assistant secretary and treasurer. Lucas and Sargeant will remain on the board of directors.

The Yoder Company manufactures sheet metal working machines, including electric weld tube mills, cold roll forming and rotary slitting machines.

NEWLY-ORGANIZED PORCELUX NAMES COMPANY PERSONNEL

Porcelux, Inc. is the name of a new porcelain enamel jobbing plant located at 6825 Greenway Avenue, Philadelphia.

Company personnel includes: Alfred Hopkins, president; George G. Ecke and Milton Hopkins, vice presidents; Louis Grossman, secretary; and Dr. Jesse Cherksey, treasurer.

The plant, which had its official opening June 25, is 200 feet long, with approximately 20,000 square feet available for expansion. The enamel furnace is a high sidewall type 6' x 6' x 12'.

"Our plans are to run a complete jobbing shop, store fronts, signs, etc.," stated Alfred Hopkins.

HAMILTON UPS O'NEIL TO V.P. OF RESEARCH

C. S. O'Neil has been elected to the newly-created post of vice president in charge of research, it was announced by Hamilton Manufacturing Co.

O'Neil joined the company in 1933. He became assistant to the works manager in 1939, engineering coordinator in 1941, and chief engineer in 1944. In 1947 he was named to the new post of director of research. He is a member of the dryer committee of the American Gas Association, and the engineering committee of the American Home Laundry Manufacturers Association.

NORRIS-THERMADOR NAMES FORD VICE PRES. OF MFG.

Norris-Thermador Corporation, Los Angeles, has announced the appointment of George C. Ford as vice president in charge of manufacturing.

In his new position, Ford is in charge of extensive manufacturing

Cowles annual sales meeting—included instruction and discussion sessions on metal cleaners, sales, and new product development—designed to provide better service to metal working industry. Attending meeting from metal cleaner department of Cowles Chemical Co. were: Left to right, front row, C. C. Bassett, C. Ozar, C. W. MacMullen, Earl Clark, R. F. Huntley; second row, Gene Brost, Bob Campbell, Bob Aufderheide, Clyde Lowe, Don Weaver, Jack Dobson, Fred Hitchcock; third row, Geo. Woleben, Gene Carman, Carl Clabaugh, Chas. Churchill and Elmer Lord.



operations involving the steel forming of bathtubs, sinks, compressed gas cylinders, stainless steel cooking ware, steel and brass cartridge cases, bomb fins and rocket containers. Norris manufacturing facilities which will be under his direction involve the 15-acre Los Angeles plant and the new Riverbank Ordnance plant.

Prior to his new position, Ford was

general manager of the Riverbank plant. Previous to employment at Norris-Thermador in 1951, Ford was vice president of manufacturing of Joyce, Inc. and president of subsidiary companies. Other experience included works and division managerships with Consolidated Vultee Aircraft Corp., and direction of vocational education at Compton College.

CHICAGO VIT TO DISCONTINUE "BETTER ENAMELING" MAGAZINE

William Hogenson, president of Chicago Vitreous Enamel Product Co., has announced that *Better Enameling* magazine will be discontinued.

In a statement, Hogenson said, "A quarter of a century ago, the porcelain enamel industry was in its infancy, commercially speaking. A great need existed for developing wider knowledge and acceptance of porcelain enamel as a finish for metal products. To answer this need, Chicago Vitreous Enamel Product Co. decided to publish a trade paper . . . *Better Enameling* . . . with the avowed purpose of 'contributing to the advancement and interest of better porcelain enameling.'

"One of the most noteworthy contributions was an original series of articles, 'The A B C's of Enameling.'

The editorial matter published over the years has contributed toward a more widespread understanding of porcelain enamel. Because it possesses many characteristics known to no other finish, porcelain enamel has become the standard accepted finish for many metal products. Ceramic education has expanded and a number of the universities now offer complete ceramic engineering courses. In general, the technology of the industry is now on a high plane.

"Thus, we feel that *Better Enameling* has truly accomplished its purpose and are, therefore, planning to discontinue this publication effective with the August 1952 issue."

Chicago Vit simultaneously announced the scheduling of a dominant advertising campaign to be run in *finish* magazine.

CERESA HEADS WESTINGHOUSE ELECTROPLATING SECTION

Myron Ceresa has been appointed manager of electroplating projects for the special products development division of Westinghouse Electric Corp., Pittsburgh. In his new capacity, Ceresa will be in charge of laboratory operations, including development, pilot plant and technical service work.

PORCELAIN ENAMEL INSTITUTE MOVES TO NEW QUARTERS

Offices of the Porcelain Enamel Institute are now located in the Dupont Circle Building, 1346 Connecticut Avenue, Washington 6, D. C.

John Oliver, PEI secretary, in announcing the new location, said that the move was necessitated by expansion of Institute activities in recent

years. Particularly cited were the National Safe Transit Program, and various research activities and government-industry liaison services conducted for PEI membership.

TOOL ENGINEERS ANNOUNCE 1952 SCHOLARSHIP WINNERS

Four winners of the second annual national scholarship contest sponsored by the American Society of Tool Engineers have been announced as follows:

Merton L. Bartsch, senior in engineering, University of Minnesota; Hearst McClellan, mechanical engineering senior, University of Cincinnati; Raymond F. Perner, mechanical engineering senior, University of Texas; and David Lee Poli, industrial engineering senior, Ohio State University. A fifth award will

be made later to a Canadian student tool engineer.

The \$300 scholarship awards are made on the basis of scholastic standing, recommendations by faculty members and the interest shown by the student in tool engineering.

AMERICAN-STANDARD MAKING REMOTE-TYPE ROOM COOLER

A remote-type room air conditioner for multi-room installations and featuring individual room control, is now being produced by American Radiator & Standard Sanitary Corp., Pittsburgh.

In operation, ventilation air is introduced separately to each room through a small wall aperture behind each unit. Designed for location under windows, the units can be free standing or recessed into the walls four inches. The unit also features a toe-step offset.

LUBRICATION ENGINEERS ELECT SOCIETY OFFICERS

The following new officers were elected at the annual meeting of the American Society of Lubrication Engineers:

President, M. E. Merchant, senior research physicist, Cincinnati Milling Machine Co.; vice president at large, W. E. Campbell, in charge of research and development in lubrication and organic analysis, Bell Telephone Laboratories; secretary-treasurer, W. H. Fowler, Jr., chief industrial lubrication engineer, Pure Oil Company; administrative secretary, W. P. Youngclaus, Jr., former regional manager, Alemite industrial division, Stewart-Warner Corp.

DRAYER-HANSON INTRODUCES SPOT AIR CONDITIONERS

Drayer-Hanson, Inc., Los Angeles, has announced a new Spotaire series of individual room air conditioners. Company engineers say that the room cooler units "possess the adequacy and quietness of a central duct system and save up to 30% without sacrificing any of the advantages of an individual unit system."

FORMER AMERICAN HOME

EDITOR JOINS G-E STAFF

Miss Rosalie Thorne, formerly associate equipment editor of *The American Home*, has joined the General Electric Company major appliance division news bureau, Louisville. It was stated that Miss Thorne will specialize in news of activities of the G-E Consumers Institute and Home Bureau.

CERAMIC SOCIETY TO BUILD STAFF HEADQUARTERS IN COLUMBUS

The American Ceramic Society has revealed plans for a new \$250,000 one-story headquarters building to be built on North High Street, in Columbus, O. Charles S. Pearce, ACS general secretary, said construction will start this year on the first unit of the building.

HOWARD WILLIAMS HEADS NEW ARCHITECTURAL PORCELAIN FIRM

The formation of Maryland Porcelain Enamel Co., 2503 St. Paul St., Baltimore, Md., specializing in the sales, design, engineering and erection of architectural and industrial porcelain enamel building materials has been announced by Howard N. Williams, president. Activities of the company will be centered at first in the Delaware, Maryland, Virginia, and Washington, D. C. areas.

"In addition to our regular architectural and industrial porcelain enamel services," stated Williams, "the company is now developing, and plans to market on a national basis, several porcelain enamel specialty items for the consumer-industrial field."

All of the firm's products, marketed under the trade-mark Perma-Steel, are being manufactured for the new company under a special patent agreement by Lansdale Porcelain Enamel Corp., Lansdale, Pa.

For the past six years, Williams was manager of advertising, sales promotion and public relations for Pemco Corporation. Well-known throughout the industry, he served three two-year terms as secretary of the Eastern Enamellers Club, and was

chairman of the Frit Manufacturers Exhibit and Display Committee, which he helped organize.

In 1949 and 1950, he served a co-chairman of the PEI Sales and Management Conference, and also, in 1950, served on a three-man committee set up to study and recommend the placement of an engineering research project to develop an approved porcelain enamel curtain wall panel. Williams is also secretary-treasurer of the Baltimore Chapter of the Armed Forces Chemical Association.

FERRO OPENS FIBER GLASS PLANT IN TENNESSEE

Ferro Corporation has announced the opening of a new million-dollar fiber glass plant in Nashville, Tenn., which will specialize in the production of fiber glass for the plastic reinforcement field. Formal opening ceremonies were held June 27.

BURT TO DIRECT SALES FOR SHERWIN-WILLIAMS

The appointment of Arthur H. Burt as director of sales for The Sherwin-Williams Company, a leading paint manufacturer with headquarters in Cleveland, has been announced by Arthur W. Steudel, president. His responsibilities cover all domestic and foreign sales.

Burt has spent his entire business career with Sherwin-Williams. Starting in the advertising department, his progression has taken him into practically every phase of the company's sales activities.

Regarded as one of the nation's best informed men in his field, he served as a member of several committees of the National Paint, Varnish and Lacquer Association in Washington during World War II.

ENTHONE ANNOUNCES NEW SERVICE FOR WESTERN STATES

New manufacturing and distributing facilities in eight western states have been announced by Enthone, Inc., New Haven, Conn., producers of metal finishing processes.

The L. H. Butcher Co., distributor of Enthone metal finishing chemicals

and processes since 1943, has been granted an exclusive license to manufacture products in Los Angeles to serve the Pacific Coast states and British Columbia. The Butcher organization will serve this area through branch offices in Seattle, Portland, San Francisco, Salt Lake City, and Los Angeles.

BORG-WARNER BUYS ALUMINUM FOIL INSULATION FIRM

Borg-Warner Corp., Chicago, has announced the acquisition of Reflectal Corp., a leading producer of aluminum foil blanket-type insulation. R. C. Ingersoll, Borg-Warner president, stated that Reflectal, with executive offices in New York City and a plant at Hudson Falls, N. Y., will be operated as a subsidiary.

R. S. Ingersoll, president of the B-W Ingersoll Products Division, will also serve as president of Reflectal. J. H. Ingersoll, vice president of Ingersoll Products, will also serve as Reflectal vice president. H. A. Schmeal has been named treasurer and assistant secretary.

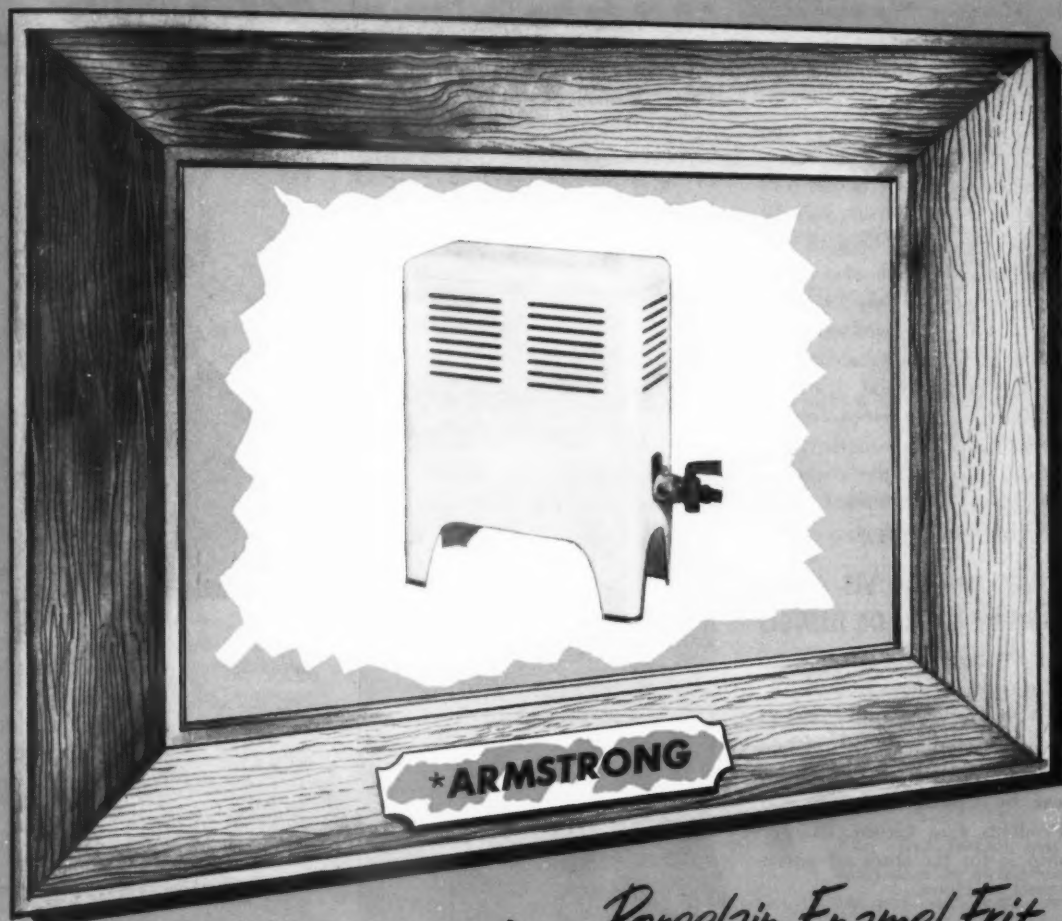
LEAKE STAMPING INCREASES PRESS CAPACITY

Another step in a continuous program of plant modernization and expansion has been made by The Leake Stamping Company, Monroe, Michigan, with the addition of new big press equipment to provide greater flexibility in the production of metal stampings. New equipment includes a 500-ton double crank mechanical press which will augment other press equipment in the Leake plant, mechanical and hydraulic, that goes up to 2500 tons in size and down to small high speed presses with 300 strokes per minute.

EXHIBIT SPACE SOLD OUT FOR PAINT INDUSTRIES SHOW

All exhibit space for the 1952 Industries Show of the Federation of Paint and Varnish Production Clubs has been reserved and assigned, according to Gene Ott, chairman of the Show Committee. The demand for space was said to have greatly exceeded the capacity of the exhibit

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CERAMIC COLORS • CHEMICALS • SUPPLIES
Our Technical Staff and Samples are available to you
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World's Most Complete Ceramic Supplier

Hommel Tite-Wite Frit available in Great Britain through C. J. Baines & Co. Ltd.
West Coast Warehouse, Laboratory and Office, 4747 E. 49th Street, Los Angeles, California

Porcelain Enamel Frit

The illustrated gas heater is a masterpiece of the Armstrong Products Corporation of Huntington, West Virginia. Hommel Frit will give you a porcelain enamel finish combining the best characteristics demanded for production performance and customer acceptance. Enameling superintendents know and respect the proved results of Hommel Frit in their shops. Not until you have made the comparison will you discover that **ONLY** Hommel Frit will give you that superior porcelain enamel finish that produces masterpieces!

hall of the Palmer House, in Chicago, scene of this year's show.

The show will open Tuesday afternoon, November 18, and will close Saturday afternoon, November 22.

DUPONT'S 150TH ANNIVERSARY

The du Pont Company's 150th anniversary was observed by employees and members of the du Pont family in ceremonies at the site of the company's first mill in Delaware, July 18.

Eleuthere Irenee du Pont de Nemours arrived on the banks of the Brandywine Creek on July 19, 1802, to build a mill for production of black powder, urgently needed by pioneers for hunting, land clearance, mining, quarrying, and self-protection. Since that time the company has grown to be one of the country's largest producers of diversified chemicals and chemical products.

ANNOUNCE CHICAGO VIT FELLOWSHIP AT U. OF ILLINOIS

The appointment of John Schultz, Jr. as Chicago Vitreous Enamel Product Fellow in Ceramic Engineering at the University of Illinois for 1952-53 was announced recently. Established this year by Chicago Vitreous Enamel Products Co., Cicero, Ill., the fellowship is for the study of porcelain enamel problems.

NICOL JOINS CROWN STOVE AS ENAMEL SUPERINTENDENT

William D. Nicol has been appointed enamel superintendent of

W. D. NICOL



Crown Stove Works, Chicago, according to an announcement by Walter F. Rogers, president.

For the past two years, Nicol was with Altorfer Bros. Co., Peoria, and before that was with Chicago Vitreous Enamel Product Co. for a number of years as a service engineer.

The announcement stated that Nicol has been given complete charge of all enameling operations, including production process methods and quality control. He is also responsible for all activities of the contract enameling division which includes production applications of high temperature heat-resisting coatings.

PHILCO UPS SCHAEFER, RICH TO TOP REFRIGERATION POSTS

John M. Otter, vice president and general manager of Philco Corpora-



R. A. RICH

tion's refrigeration division has announced the appointments of Raymond A. Rich as vice president of the division, and Harold W. Schaefer as vice president-engineering of the division.

Schaefer had been director of refrigeration and range engineering since April, 1951. For the past year, Rich has been vice president-products of the division.

JACOBSON NAMED TREASURER OF QUALITY CONTROL GROUP

The Midwest Quality Control Conference Committee, comprising 14 sections of the American Society for Quality Control, has elected H. J.

Jacobson treasurer. He is quality control director of Grand Sheet Metal Products Co., Chicago.

MCDANIEL, STRICKLAND NAMED HOTPOINT V.P.'S

John C. Sharp, president of Hotpoint Company, has announced the



H. A. STRICKLAND

appointment of John F. McDaniel, manager of marketing, and Harold A. Strickland, manager of engineering, as vice presidents. Each man will also continue in his former position.

ENAMEL INSTITUTE NAMES ADMINISTRATIVE ASSISTANT

Homer J. Humbert, of Washington, D. C., has joined the staff of the Porcelain Enamel Institute as administrative assistant. His duties will be in connection with PEI committee activities and industry contact work, the announcement states.

With his addition to the PEI staff, the Institute is in a position to better serve its membership and the entire porcelain enameling industry, said Edward Mackasek, managing director.

Humbert has been in the advertising and public relations field since 1945, previously having been affiliated with the James S. Beattie advertising agency, Washington, D. C., and later with the *Washington Post*. Most recently, he had been eastern district representative of merchandising sales-promotion for a subsidiary of Standard Oil Company of California.

Finishing fruit and vegetable juicers

→ from Page 20

the lids are placed on wooden fixtures in the spray booth . . . the fixtures being equipped with wooden axles which fit through the center of the lids, and upon which the lids can be revolved by the painter while spraying.

The back side of the lid gets one fog coat of synthetic black baking enamel at 45 pounds gun pressure, and the face of the lids get two coats of the same baking enamel at the same gun pressure. The finish is a tough acid resisting enamel that fruit juices will not affect. It also can "take" home abuse, for you can hit it with a hammer and the lid will break before the finish adherence will fail.

The painted lids are placed on trays and baked in the oven for 30 minutes at 120 degrees F.

When cool the lids are taken to the polishing shop where the white is "spotted off" from the black, where the handles rest on the edges of the lids, the buffing being accomplished on the polishing lathes, using a shield—a technique adopted from an old jewelry polishing technique, but applied to industrial work, to get two-color work.

In addition to finishing the lids the black bakelite lid knobs on which the handles rest are deburred, flash removed and polished. The white plastic juice bowls, and the two black bakelite (upper and lower) housings get the same treatment. The molding between the upper and lower housing is about the only part that is finished when purchased.

In sub-assembly the motor is installed, switches and wiring connected, lower housing feet put on (3) and the lower and upper housings bolted together and motors tested. In final assembly the juice bowl and basket assembly, the handle, automatic feed and lid are installed, and final adjustments made. Then the juicer is inspected, inspection run, cleaned, waxed and trim bands and Sweden Speed Juicer decals put on. The juicer is then ready for shipping.

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AMERICAN CHEMICAL PAINT COMPANY

AMBLER



PENNA.

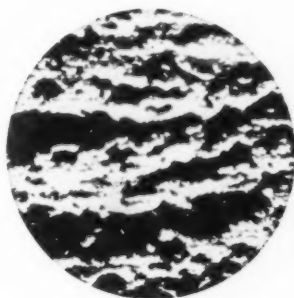
Technical Service Data Sheet

Subject: EFFICIENT PICKLING WITH **RODINE**®

ADVANTAGES OF "RODINE"

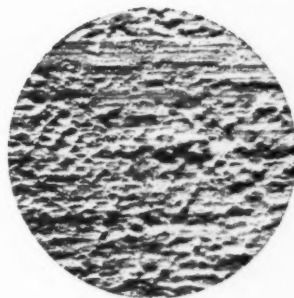
RODINE is used in sulfuric and muriatic acid baths for improved pickling and increased production. It meets Government Specification U.S.N. 51-I-2.

In straight line pickling of wire, rod and tubing, RODINE makes available more metal for drawing by protecting steel from acid attack. In batch pickling of sheet steel, RODINE improves the surface. In rapid, continuous strip pickling, RODINE not only saves acid and metal, but also prevents over-pickling during line shutdowns.



▲ This steel surface was pickled in an uninhibited acid bath. Note the deep pits, and that the surface is visibly crystalline.

► This surface was pickled exactly like the one above except that "RODINE" was added to the acid solution. Only scale pockets and roll marks are visible; no pitting occurred.



WRITE FOR DESCRIPTIVE FOLDER ON "RODINE" AND INFORMATION ON YOUR OWN PICKLING PROBLEM.



Enameling aluminum

→ from Page 37

wheeled into the furnace. Each truck has 13 uprights with 9 cross arms evenly spaced. This allows room for 18 pieces 16-feet long of the 8½" width moulding. Each piece is supported at 15-inch intervals. Up and down the truck the pieces are spaced every 3½ inches. The truck weighs 150 lbs. and the pieces weigh about

200 lbs. for a total furnace charge of 350 lbs. The electrical capacity is 150 kw to meet this demand. Five trucks are used to form a cycle. One in the oven, one waiting to go in, one being sprayed, and two cooling.

Testing and Inspection

Eighteen pieces of the 8½-inch shape are drawn from the raw stock rack. These are treated as a group all at the same time on the same rack

through the tanks. These same 18 pieces then form one truck load for future spraying and firing. Accompanying these pieces is a six-inch sample piece which receives processing at the same time and in the same manner as the rest of the load.

When the truck is completed the sample is subjected to the accelerated weathering and water spalling test. The test consists of placing the sample in a bath of 5% ammonium chloride at room temperature. Inspection of the sample is made at the end of 24 and 96-hour intervals. If at this time the enamel has not come off further back from a filed edge than ⅛ inch, the truck load is given final approval.

The stock lengths themselves undergo a thorough eye inspection for color and surface discontinuity.

Color inspection is critical


We recognize the need for the best possible type of color inspection due to the nature of our product. Lengths run today may be used adjacent to pieces run a year before or a year later on a large building facing. Satisfactory color match under these conditions is a requirement of the product.

Inspection for other defects includes looking for tears in the corners, enamel drips, black spots, chips, dents in the metal, etc.

Re-rolling

The manner in which the pieces are held during firing forces us into a straightening operation which is the final operation. The piece being held at 15-inch intervals and the metal so near the melting point the male edge of the moulding tends to sag between the suspending bars. Also since a greater mass of metal is on the groove side of moulding, the piece takes on a lateral bow. At the same time since 3 coats have been applied to the face side and only 1 coat to the back a transverse bow or crown occurs.

All these forms of distortion are corrected in one pass through a set of rolls. Here the rolls are shaped in reverse to the crown and the piece on passing through is bent in reverse



There's **NO OVERSPRAY**
TO BE EXHAUSTED
with the **RANSBURG**
No. 2 PROCESS

● On most production lines the RANSBURG No. 2 PROCESS will give 25% to 75% MORE pieces per gallon than ANY other spray finishing system—2 to 4 times as many as hand spray.

Here are other **EXCLUSIVE** advantages:

1. Eliminates conventional spray booths.
2. Eliminates practically all paint rejects.
3. Eliminates most building heat loss through exhaust systems.
4. Eliminates use of compressed air.
5. Eliminates skilled labor.

Write for our descriptive brochure on the world's finest spray finishing system—the RANSBURG NO. 2 PROCESS—which shows representative, production installations in plants throughout the country.

Electrostatic Painting Processes

RANSBURG ELECTRO-COATING CORP.

Indianapolis 7, Indiana

RANSBURG

to flatten it. At the same time pressure is applied to the male edge with wooden blocks covered with leather. The pressure takes out the sags occurring on this edge and in doing so lengthens that side of the piece which also removes the lateral bow.

This operation may sound brutal; however, it is not. The piece moves quite slowly and the only material in contact with the enamel is the leather covered blocks and the rubber drive rolls. This results in no harm to the enamel or its bond to the metal.

The rerolling having been done, the porcelain-on-aluminum Zourite is complete and ready for our stock racks or shipment to our warehouse or distributors anywhere in the country to be stocked or used along with previous or future shipments.

Control of the enamel process is carried on by the laboratory. Every day chemical checks are run on the treating tanks. Concentration of the solution is kept within the range set up in Bulletin 31. The temperature of the pre-treatment tank is maintained by a thermostatically controlled valve in the steam coils. Also as load is ready to go in the tank, the temperature is checked with a hand thermometer. The timing of the load in the tank is done with an electric clock; a bell signals the end of the dip time.

About once a week a sample is taken from each mill at the completion of a grind. This sample is then tested through 325 mesh screen as outlined earlier.

Twice each day a check is made on the balance of the electrical control units on the furnace.

This tight control that we have placed on the operation may seem too close and too costly. Actually, however, the results have more than made up the expense and effort. Today, with the control, we insure the quality of the product and have wider acceptance in the field. Also today for each man-hour in the department the scrap cost is \$0.50. For the year 1949 for each man-hour in the department the scrap cost was \$2.55. If this 1949 ratio were substituted into the 1951 production, our

finish AUGUST • 1952

scrap cost would be \$13,000 for the first seven months in place of the actual \$2300.00. As you can see our efforts have been well rewarded.

Adapted for *finish* from a paper presented before the 1951 Porcelain Institute Forum for plant men.

Paint utilization

→ from Page 31

low atomizing pressure or material of too great viscosity; with pressure

feed, too high fluid pressure for cap's normal capacity; too large nozzle for material used.

6. "Split spray" pattern—due to: air and fluid not properly balanced. Reduce width of spray pattern by means of spreader adjustment valve or increase fluid pressure. This latter adjustable increases speed and gun must be handled much faster.

For Numbers 1 to 4: Determine if obstruction is on air cap or fluid tip.

America's top salesman, Arthur Godfrey, will be talking to your prospects... the housewives, making Fiberglas* Insulation even more valuable as a sales feature for you.

Starting in September



Presents

"ARTHUR GODFREY TIME"

on CBS TV
and RADIO



A SWELL FEATURE TO HAVE...

A SWELL FEATURE TO SELL...

and now more than ever!

*FIBERGLAS is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with fibers of glass.

Rotate cap one-half turn and spray another pattern. If defect is inverted, obstruction is on air cap; if not inverted, it is on fluid tip. Clean air cap as described. Check for fine burr on edge of fluid tip or for dried paint just inside opening.

For Numbers 5 and 6: If adjustments are out of balance, re-adjust atomizing pressure, fluid pressure and spray width adjustment until desired spray is obtained.

What causes "orange peel" finish?

A common cause is improper thinner or too cheap a thinner. A thinner containing a high per cent of low boiling or cheap solvents will cause "orange peel" regardless of how the material is applied.

Other causes are: insufficient atomization; gun too far from surface; gun too close to surface—air has tendency to ripple surface; material not thoroughly dissolved or agitated; with synthetics and lacquers, drafts in finishing room; with synthetics, too low humidity.

What causes streaks in finish?

1. Tipping gun. One side of pattern hits surface from shorter distance causing more material to be supplied at this point.

2. Air cap or fluid tip may have dirt or burr on them causing heavy top or bottom pattern.

3. "Split spray" causing more material to be applied at top and bottom of pattern. Increase fluid pressure or reduce width of spray by decreasing horn air.

What causes runs & sags in finish?

1. Sags and runs are the result of too much material applied on the surface.

2. Gun tilted at angle. More material is supplied where pattern is closest to the surface.

What causes mist or fog?

1. Over atomization due to: too high atomizing air pressure; wrong air cap for material used; wrong fluid tip for material used; fluid pressure too low (pressure feed).

2. Improper use of gun: incorrect stroking; gun held too far from the surface.

What is "starving" the spray gun?

By "starving" is meant insufficient air reaching spray gun. This may be due to: waste in transformer too tightly packed, or clogged with rust and dirt; air cocks too small size; clogged air lines; air hose or pipe line too small diameter; inadequate air supply.

What is the procedure in doing a touch-up job?

1. Sand spot or scratch. Be sure a good feather edge is obtained. This should be so gradual or finely tapered that metal cannot be detected from finish.

2. Liberally build up with primer-surfacer, making certain that it extends beyond the feathered edges and is applied heavier than surrounding finish.

3. Then sand until level and perfectly smooth.

4. Apply finish material.

5. A mist coat of thinner will smooth out rough spots.

6. Then apply the finishing coat.

Have YOU Tried W-A1 METAL CLEANER

for immersion cleaning
prior to porcelain ename-
ling? It's a specification
material that has proved
its worth in many ena-
meling plants.

Same Quality
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MANUFACTURERS OF
LEPCO PRODUCTS

V. B. PUNDERSON COMPANY

402 SWETLAND BUILDING

CLEVELAND 15, OHIO



A bathing beauty and a heater—have very little in common except, suggests Estate Stove Company, to indicate that the home with an Estate Heatrola enjoys all-year-round comfort and healthful climate—or that both heater and pin-up girl are styled to please the eye. And, anyway, a man in the appliance trade can't think about business all the time.

The heater pictured is a new promotional model introduced at the Summer Homefurnishings Market in Chicago. It has a rated hourly 32,000 btu output.

Summer homefurnishings market

business back to normal with prospects ahead for complete stability

THE retail homefurnishings business is back to normal with prospects ahead for complete stability, a good augur to the whole national economy, according to D. J. Desmond, president, National Retail Furniture Association.

Desmond told magazine and newspaper writers attending a Summer Homefurnishings Market press luncheon that only a world catastrophe would jar the hopeful outlook.

This view of normalcy was also shared by most manufacturers who exhibited their lines at the American Furniture Mart and The Merchandise Mart in Chicago. Most manufacturers agreed that the buyer is in con-

trol again, and that smart merchandising is needed to sell appliances and other homefurnishings.

An outstanding feature of the market was the growing number of manufacturers including clothes dryers in their product lines, reflecting the tremendous reception housewives are giving this new laundry appliance.

A proposal that appliance manufacturers "bring out one basic line of major appliances per year" was advanced by Mort Farr, president of the National Appliance and Radio-TV Dealers Associations.

In refrigerators, the major appliance that has been most subject to multiple lines, production runs are

now much shorter than they were before and mass-production savings are particularly needed for competitive pricing. If the line is introduced in January, the dealer would have plenty of time for planning and selling his old inventories so that they're not competing with new merchandise for sales when the spring and summer refrigeration selling season arrives, stated Farr.

Profitable business still existing in most markets

"There's still profitable business to be had in most markets," declared Farr, "if you're willing to work and fight for it with full imagination and strength."



R. F. Remer, Nash-Kelvinator assistant sales training director, and W. L. Hullsiek, Leonard Division sales promotion manager, discuss the "Fundamentals Never Change" marketing theme of their summer exhibit.



Karl Bruch, of Westinghouse, shows N. B. Watson and Ellis Moutoux, Evansville dealers, how they can increase their business through trade-ins. Westinghouse exhibit stressed "double profits through trade-ins."

finishfotos

Diane Jedick shows off a new Tappan range with special work shelf which drew praise from visiting dealers.



E. N. Stiglitz, right, shows Chas. Glassman, of Boston Stove Foundry, the new Stiglitz clothes dryer.



New Supplies and Equipment

H-10. New gas appliance timer requires no electric current

A new automatic gas shut-off valve and timer for manual control gas appliances, is said to require no electric current. Called the Gastimer, the unit is ideal for use with water heaters, hot plates, laundry stoves, room heaters and incinerators.

A manual hold-open lock allows removal of timer mechanism without interrupting gas. A pilot take-off is also available. The manufacturer states that a sample Gastimer is available to appliance manufacturers who request it on their company letterhead.

H-11. Spray gun with sensitive controls for fine spraying

A new spray gun with ultra-sensitive controls for fine spraying has

H-12. New metal slitting saw cuts 750-hr. job to 2½ hours

The photo below shows a metal slitting operation on a cast iron rotor as done by a new carbide-tipped metal slitting saw. This particular installation has proven extremely successful, doing a job in 2½ hours which formerly took 750 hours.

In this case, 10 slots were required

More Information

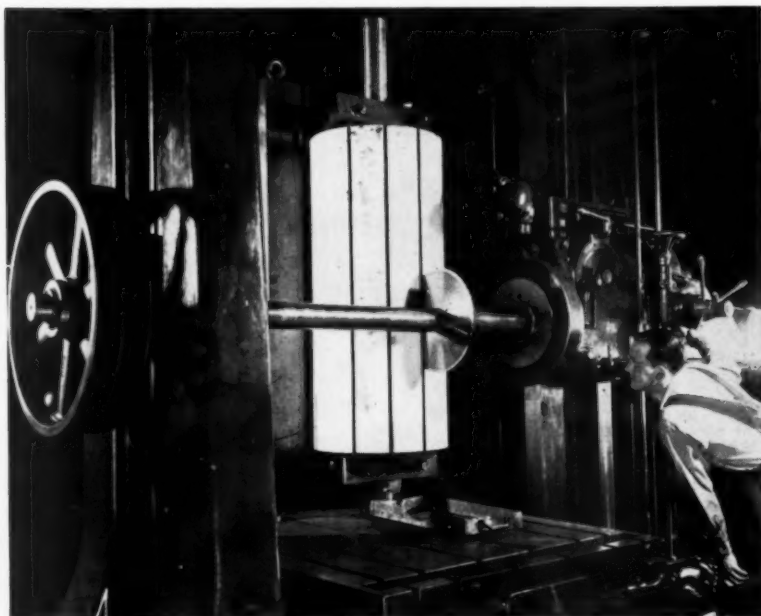
For more information on new supplies, equipment and literature reviewed here, fill out the order form on Page 62, or write to us on your company stationery.

been introduced to the finishing trade.

The gun is designed for small re-finishing jobs, stenciling, blending, high-lighting and decorative work. Its spray pattern is medium size, and can be adjusted to practically pinpoint size for touch-up work.

The gun body is an aluminum die casting, which permits the use of a wide range of materials including latex. The gun can be used with glass jar fluid containers of 2, 4, 6 or 16 oz. capacity. The trigger is designed for either left or right hand operators.

in a 2000-pound alloy iron rotor, the slots to be 5¾" deep by 52" long by .140" wide, plus or minus .002". The rotor was also to be cut with the same number of slots have .437 width, plus or minus .002". The slots must pass a rigid inspection as the rotor holds fins which slide in the slots.



The new carbide-tipped blade did the job on a boring mill, completing all ten slots in 2½ hours. A previous method required 75 hours per slot, or a total of 750 hours.

H-13. Toolmakers' parallel clamps



A Chicago-area precision tool manufacturer has announced a line of toolmakers' parallel clamps with openings ranging from 5/8" to 3½". The company states these clamps compare in quality with the finest on the market, but are said to be very competitively priced.

The clamps are hardened throughout, and have metal clips to hold the screw in place on the return. The company claims immediate delivery on all orders, and states it will fully guarantee the quality of these parallel clamps as compared with any on the market.

H-14. Metal primer dries fast for re-coating with finish coat

An iron oxide zinc chromate primer for steel and iron has been perfected which can be re-coated with lacquer or any other finish coat within three minutes after application, without lifting or crazing. It dries in 10 minutes.

The primer, according to the manufacturer, is exceptionally durable without a finish coat; under outdoor exposure it will protect ferrous metals for several months.

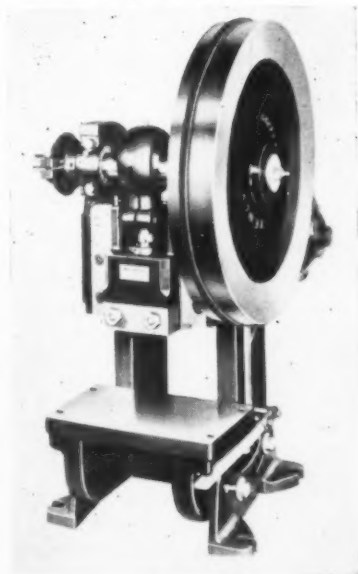
It has a satin flat finish that can be applied by spray, flow coat, dip, or brush.

H-15. Cold galvanizing process

After two years of extensive testing, new method of cold galvanizing for surface protection of steel and iron has been announced. The process utilizes a cold galvanizing compound.

The compound may be applied with any ordinary paint brush, electric spray gun or by cold dip. The new compound gives effective results on any structure from an iron or steel bridge to a rusted garden gate. It is stated that Marine users have found that the product, when applied directly to a ship's hull, will prevent sea growth, corrosion, and electrolysis.

H-16. Small punch press with large press features



A new line of 4 and 5-ton punch presses contain many outstanding features, including: 12 $\frac{3}{4}$ " throat; variable speed (from 90 to 280 strokes per minute); adjustable ram clamp with square hole (adjusts from 1" to 1 $\frac{9}{16}$ "); clutch drive safety feature which shears at excessive overload preventing press breakage; non-repeat safety mechanism which eliminates double trips; 3" drop in movable bed to accommodate larger dies or die sets; interchangeable parts.

The presses are of extra rugged, precision-built construction, weighing 275 to 450 pounds.

One user wrote the press manufac-

turer that his factory had blanked out over 5 $\frac{1}{2}$ million pieces on their press and it was still "going strong."

H-17. Specially-designed gantry for semi-automatic welding units

A specially-designed gantry for semi-automatic welding units features a rapid, tri-directional adjustment for the welding gun. An added feature of this fixture is the easy access the operator has to all welding machine controls because the entire unit fits compactly on a caster stand beside the operator. All circumferential welds from a practical minimum to

54" in diameter can be made with the illustrated standard rack.



H-18. Lightweight stacker with telescopic lift of 136 inches

Mechanical stacking of light, bulky loads without waste of lifting capacity is possible with a new electrical industrial truck one-fourth lighter than driver-led unit now doing comparable work.

Constructed some 600 pounds lighter than comparable units, it is built for capacities up to 1500 pounds.

The telescopic version tiers to 136 inches, with over-all collapsed height of only 83 inches. Non-telescopic lift is 69 inches. Lifting speed of the unit is 17 to 25 feet per minute loaded and 36 feet per minute unloaded. Traction speed is 3 miles per hour unloaded and 2.75 miles per hour loaded.



H-19. Mill-type power strap dispenser for volume use of strapping

The unit shown on the right is for volume users of heavy-duty steel strapping. It handles ribbon wound strap $\frac{3}{4}$ ", $1\frac{1}{4}$ " and 2" widths. Feeds strapping at rate of 6 to 10 feet per second. Cutting operation required only 2 to 4 seconds.

Strongly and compactly made with extra-heavy steel frame, it occupies space 3' x 5', 3' high. It has push-



button control of strap feed. The unit weighs 374 pounds empty.

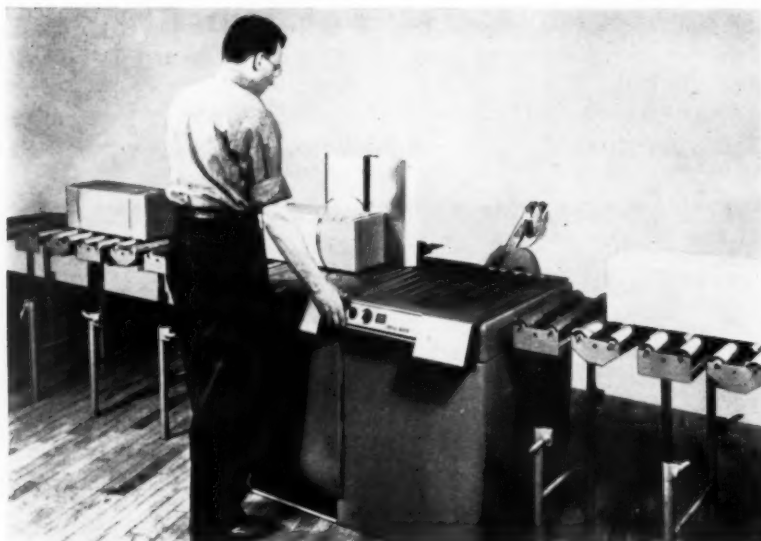
H-20. High-volume strapping machine spot welds strap joints

The power-driven strapping machine shown in operation is designed to speed high-volume flat steel strapping operations.

Featuring a streamlined housing for integration into standard conveyor lines, the machine produces welded joints with strengths ap-

proaching the tensile strength of the size of strapping used. The machine can accommodate many different package sizes.

In operation, packages approach the machine on a roller-conveyor from the right. Roller sections in the table top of the machine facilitate



FINISH
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Chicago 1, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. _____	No. _____	No. _____	No. _____
No. _____	No. _____	No. _____	No. _____
Name _____		Title _____	
Company _____			
Company Address _____			
City _____		Zone _____	State _____

location of packages over the tensioning and welding unit, eliminating the necessity of manual lifting.

Industrial literature

811. Illustrated 32-page booklet on new metal forming equipment

Booklet describes a new metal contour former which combines stretch, compression and radial draw forming methods.

812. Submerged combustion equipment for heating pickle solutions

Bulletin describes how the use of submerged combustion equipment saves acids, permits faster pickling, and results in high thermal efficiency. Manufacturer states that a leading producer of domestic water heaters is achieving "very satisfactory results" with this new development.

813. Stripping coatings from parts

Bulletin tells how to put stripping on a production basis. Describes a non-toxic, non-inflammable and non-corrosive stripping agent for removal of paints, enamels and lacquers from conveyor hooks and equipment, and from metal parts.

814. New 40-page booklet on line of industrial spray nozzles

Engineers responsible for specification of spray nozzles for metal cleaning, bonderizing, spray quenching, gas washing, etc., should be interested in this illustrated industrial nozzle bulletin. Data includes nozzle dimensions, capacities and spray angles.

815. Guide to better packing and shipping methods

Shippers and receivers will be interested in checking their strapping applications against the information just published in a 40-page pocket-size catalog. Selected case histories describe specific use of strapping. The catalog lists for rapid reference information on packaging, car doorway protection, automatic power machines, freight bracing, and heavy duty applications.

816. Electric radiant panels

Bulletin tells how new infra-red system can be used for paint baking, curing, drying, degreasing, etc.

817. Sub-contract facilities

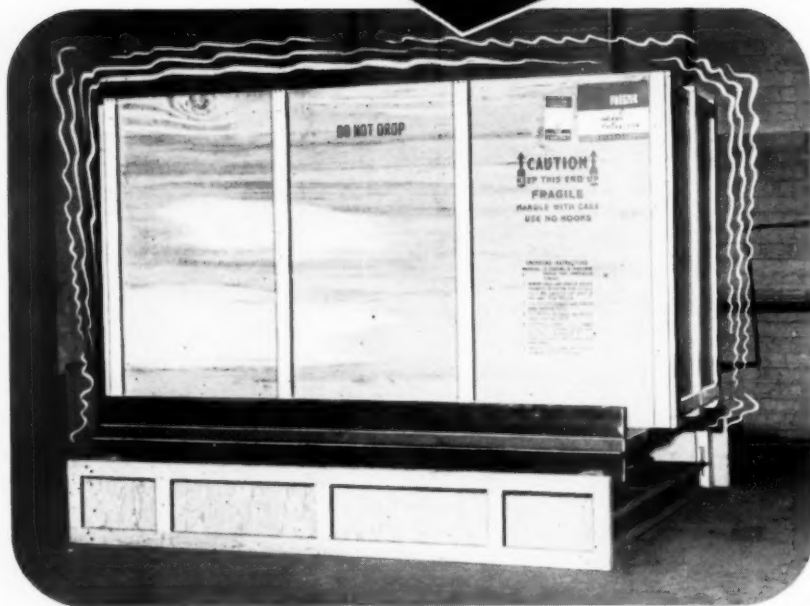
Special brochure describes complete facilities of company with AAA-1 rating with large plant space available for defense sub-contract work.

August • 1952

safe transit

FROM ASSEMBLY LINE TO FINAL CUSTOMER

CHICAGO MILL'S LABORATORY ROAD TEST



We check your crated product to pre-prove its shipability

This vibration or "laboratory road test" is one of the standard tests applied to your finished crated product in the Chicago Mill Laboratory. The test duplicated the vibrational shocks encountered during transportation.

Here is only one step in the pre-proving program of our completely equipped and staffed laboratory — a National Safe Transit Certified Laboratory.

Chicago Mill is the only single source for all the types of crates and boxes listed. Our engineers will recommend the type of crate or box best suited to your product.

Technical information, packing information and testing services are available without obligation.

Any Chicago Mill representative will arrange for engineering or testing services — or just write or phone our Chicago Office.

Wirebound,
Nailed or Hinge Corner
Cleated Plywood
Cleated Cravener
Cleated Corrugated
Watkins Type Containers
Shop and Tote Boxes
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★
FOR DOMESTIC OR EXPORT
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A SHIPPING CRATE OR
BOX TO FIT ANY
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safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and allied metal products field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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PROMOTE MATERIALS HANDLING EDUCATIONAL PROGRAMST-12

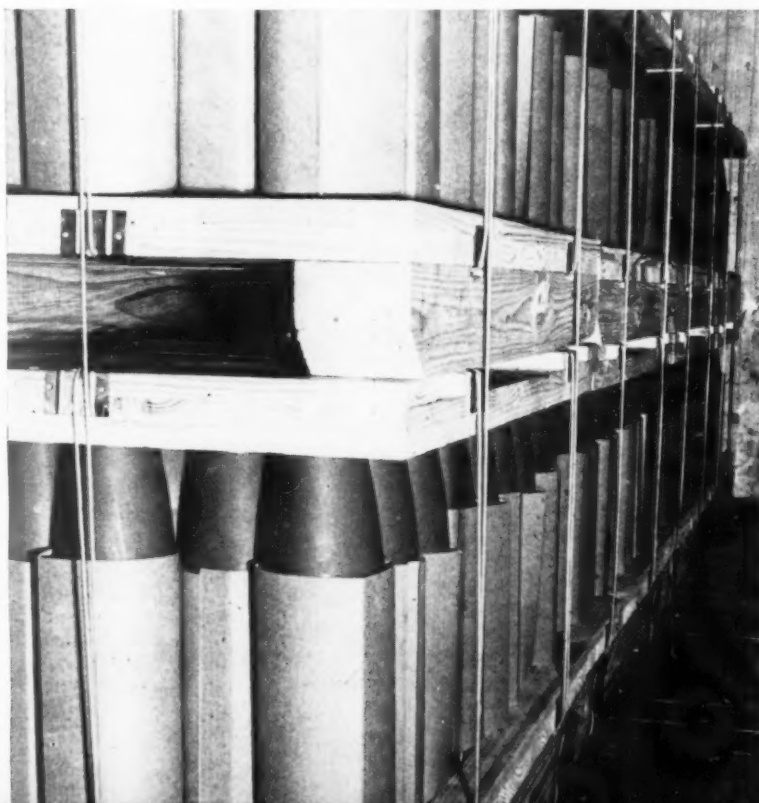
NST CERTIFICATION FOR BRYANT AND WESTINGHOUSE DIVISIONS ST-14

PACKAGING, MATERIALS HANDLING SHOW IN CHICAGO, OCT. 14-16..ST-16

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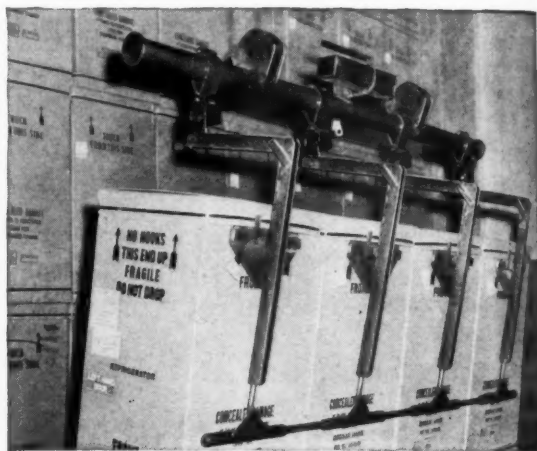
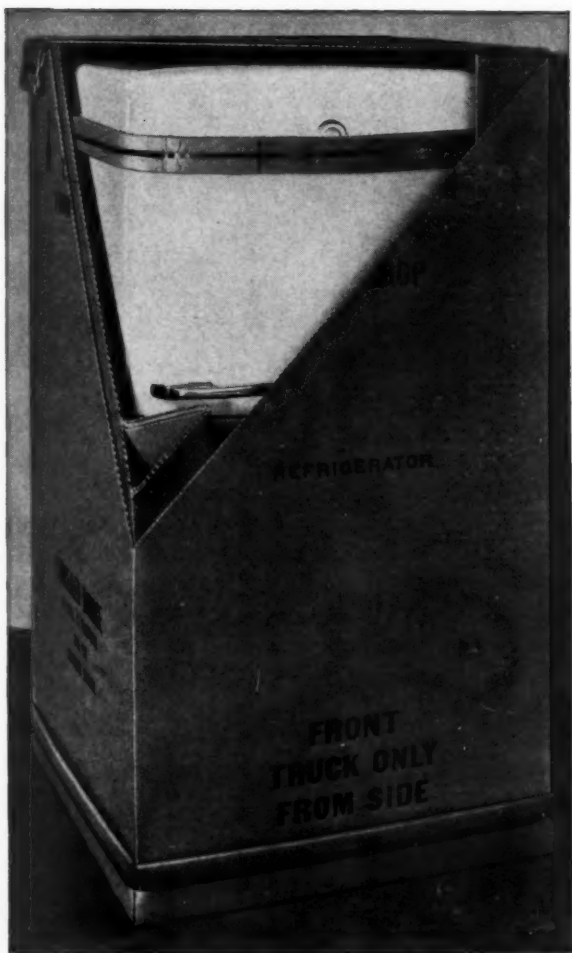
A new method of car blocking—is being employed at the Chevrolet-St. Louis Shell Division plant. Photo above shows the "before" method, and photo below shows the "after" method. For further details read article on Page ST-8.



CUSTOM DESIGNED

HEAVY-DUTY SHIPPING CONTAINERS

International's heavy-duty corrugated shipping containers are now being used for such products as stoves, water heaters, washing machines, refrigerators and furnaces. Each product presented its own individual packaging problems.



GENERAL ELECTRIC and our Container Division engineers designed and thoroughly tested this new package which provided better protection and enabled improvements in material handling methods. It was the first of our inter-locking TUBE-AND-CAP construction. Scored and folded corrugated sheets brace the refrigerator inside the outer container.

For lifting, a special fitting was developed to eliminate a fork: a U-shaped lip that hooked under the edge of the top cover. (See above) In G. E.'s warehouse 4 refrigerators are picked up at one time.

After thousands of successful carload shipments damage claims have been less than for the previous type of package. The corrugated fibre container is now used for all G. E. household refrigerators.


International Paper company

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Georgetown, So. Carolina

NST testing correlated with shipping performance can reduce damage losses

by Clark Hutchison •

PRODUCT DEVELOPMENT & TECHNICAL ENGINEER, INGRAM-RICHARDSON, INC., FRANKFORT, INDIANA

safe transit

By now it is pretty well accepted by manufacturers of home appliances that use of National Safe Transit test procedures can help reduce damage. There are many published statements from those certified under the program reporting benefits. Of course, as with any program, there is a difference between minimum and maximum compliance. Those getting the most benefit are those making the most use of the tests.

Frequency of testing

More and more, manufacturers are realizing the value of frequent pre-shipment testing for quality control purposes and trouble shooting, as well as for design engineering.

One manufacturer was receiving reports of damage to one range model. Safe Transit tests apparently did not reproduce the damage. It was known that the fabrication of the troublesome part caused a small metal crack in a percentage of the panels. Normal practice was to weld these panels, and tests indicated this to be perfectly satisfactory. However, closer study showed that in some cases cracks were not completely welded. Tests on these particular panels with incomplete welds resulted in about 75% failure. Such parts were a part of normal production, but represented only a fraction of the total. The usual sampling procedure for pre-shipment tests usually failed to catch them.

In another case, reports from the field kept coming in regarding damage to a range top. Safe Transit tests

were tried and did produce cracks at the trouble spot. More incline impact (Conbur) tests, in conjunction with electrostatic inspection, revealed that the cracks started with a 2½ zone shock. Further checking showed that a percentage of the ranges were coming off the assembly line damaged in the same spot.

Fifty-hour vibration tests for experimental work

Some manufacturers go even further than National Safe Transit test requirements. At least two manufacturers run fifty-hour tests for experimental engineering purposes compared to the one-hour Safe Transit requirement. Drop tests are sometimes used in addition to Conbur tests for products under Project 1 of the National Safe Transit Program. An increasing number of companies are using an electrostatic inspection method (see Figure 5, Page 25, July finish) in addition to Conbur and vibrator tests in connection with design and construction problems.

Switching tests have been made to determine the effect of impacts at various speeds. One manufacturer makes such tests periodically to evaluate loading and bracing standards (finish, April 1952, page ST-9).

Generally, those shippers who have reduced damage to a minimum do not rely on pre-shipment tests alone. Field results are studied to see how they correlate with test results.

Pre-shipment tests correlated with test results

This field study usually includes study of damage reports furnished by carriers' inspection agencies. It also

usually includes some form of report to be furnished by the consignee as to the arrival condition of shipments. These consignee reports vary from a very simple request for a total of products received and total damaged, to rather complicated forms requesting description of carload, detailed description of damage, and opinion as to cause. Experience seems in favor of the simpler forms. Complicated forms take too much time to fill out, are often ignored by the receiver, and are often meaningless anyway, since the person making out the report is often not qualified.

Surveys of damage by actual inspection in addition to damage reports are helpful. This helps determine responsibility for damage, and at least gives a clearer picture of what to look for when making pre-shipment tests. To accomplish this, some firms have field men whose duties include reporting on instances of damage. Another practice is to ship test cars, with factory representatives checking results at destination. Some-

CLARK HUTCHISON



times test cars are shipped and returned to the factory for opening to study results.

The conclusions reached by inspection are sometimes quite different than from reports. One shipper received reports of almost 100% damage in four consecutive cars to one warehouse. Investigation disclosed that "damage" consisted of a small assembly chip around a bolt hole, which in no way affected appearance

or utility of the product investigated.

Importance of checking actual shipping performance

The importance of checking actual shipping performance is shown by another example. The crated appliance repeatedly passed Safe Transit tests. Yet, in shipping to the same point, product damage was 18.4% in seven test cars as compared to 2.2% in another seven test cars employing a different loading method.

While there is perhaps no actual criterion of good performance, a number of manufacturers of major appliances report product damage of 0.5% or less. In each case this figure

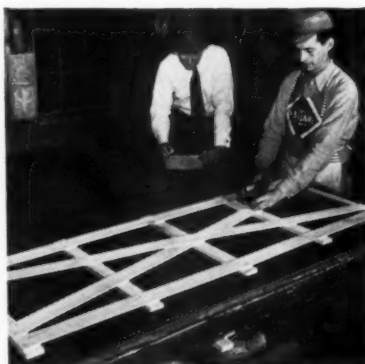
Editor's Note:

Clark Hutchison has just rejoined the ranks of Ingram-Richardson, Inc., as product development and technical engineer, after working for some time with the Association of American Railroads. As ceramic engineer in the AAR freight claim department, Mr. Hutchison worked with the shippers to "discover" the sources of loss and damage to their packaged appliances and allied metal products. His article should be of interest to shippers and carriers alike.

WEYERHAEUSER CRATES

are pre-tested

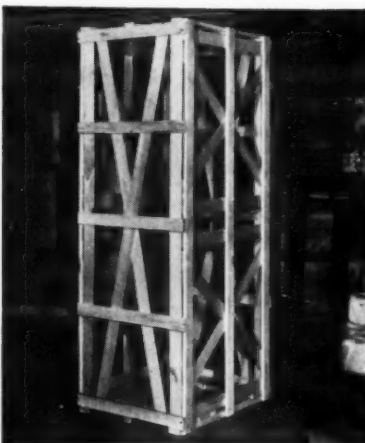
3 ways



1 Weyerhaeuser crates are carefully engineered and pre-tested three ways. Crating engineers give special attention to stress requirements and practical construction.



2 When a design is agreed on, engineers make and test a working sample, to make sure the new design will meet size, construction and nailing requirements.



3 As the final step, Weyerhaeuser checks each crate, part by part, for correct and easy assembly, extra strength and rigidity.

Weyerhaeuser "pre-tested" crates are shipped in sections . . . strapped for palletized handling, or in bundles for one-man handling . . . and are immediately available to meet your needs. For complete information, phone or write

Weyerhaeuser Sales Company

INDUSTRIAL WOOD PARTS DIVISION

Room 2139, 400 West Madison, Chicago, Ill.



represents a considerable reduction from previous performance. And in each case, a thorough program of pre-shipment testing correlated with study of shipping performance has been a major factor in this reduction of damage. All believe results have been worth the effort.

In many instances, rough handling is the reason often given as an explanation for damage. But is it always the actual cause? Consider the following cases.

One manufacturer shipped four test cars. Four damaged ranges were unloaded from a car containing an impact recorder showing a 9-mile per hour shock. On the three other cars, for which impact recorders showed maximum shocks of less than 4 miles per hour, damage was eleven ranges, two, and none. Rough handling, in transit at least, would hardly seem to explain the damage.

Two carloads of sinks were received damaged — obviously shock damage. But examination showed that a mistake in crating specifications had been made, and sinks were loose in crates.

Another manufacturer concluded that all damage was due to rough handling in transit, based on a test car containing an impact recorder. But seven damaged ranges were unloaded from another test car in which a recorder showed maximum shock of 1st quarter of 2nd zone.

The products involved in each of the three preceding examples carried

the National Safe Transit label. However, results do not reflect on the usefulness of pre-shipment tests. Perhaps more frequent testing would have provided the answer in these particular cases.

WESTINGHOUSE HOLDS PACKAGING, HANDLING COURSE FOR FOREMEN

Supervisors and foremen of Westinghouse Electric Corp.'s East Pittsburgh Works are currently participating in a 12-session materials handling course. Designed to help in the reduction of an estimated \$100,000,000 cost of moving materials in 1951 in Westinghouse, the course is open to selected representatives of all departments of the plant.

Topics of discussion include plant layout, problem analysis, improvement procedures, techniques, equipment, in-process handling, packaging, storing, and other subjects. The weekly two-hour sessions are filled with lectures, movies or slides, and a discussion period. In addition, printed matter pertinent to the particular phase of materials handling being covered is distributed to the class.

As a part of the course, class members are required to undertake a materials handling project in their respective departments and work them through to completion. Occasionally, the class goes into the shop to observe some member's project and to discuss the various features.

The program is coordinated by the East Pittsburgh supervisory training department, and is presented by R. W. Mallick, a staff engineer of the executive department.

AMERICAN BOX UPS EGER TO ASSISTANT SALES MGR.

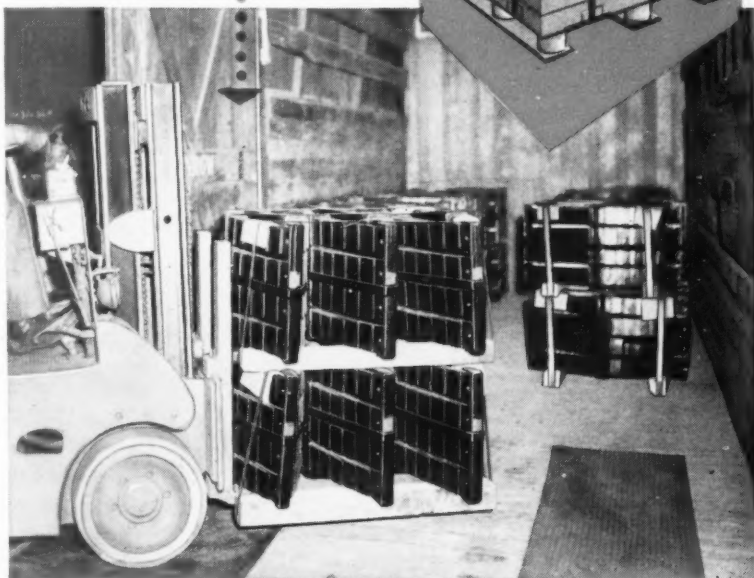
The American Box Co., Cleveland, has promoted William A. Eger to assistant sales manager under A. R. Caputo, sales manager, according to George H. Kubes, president.

A native of Cleveland, Eger began his service with American Box nearly 35 years ago under J. P. Kubes, Sr., founder of the company. He holds the longest service record in the firm's sales department.

finish AUGUST • 1952

Saved 14 containers!

**Saved 50%
handling costs!**



SIGNODE OFFERS YOU BETTER STRAPPING METHODS*

Even your "best" can be improved. A manufacturer of TV transformers formerly shipped 168 units in 15 cartons. Signode helped them work out a multi-unit package

combining 175 units in one—bound into a compact pallet load with Signode steel strapping. This application was easy to work out but...

this one was a toughie!

Diesel springs, heavy and unwieldy, formerly were shipped loose in railway cars. At the point of assembly, each of eight component parts of the spring had to be handled separately. Signode, with the foundry men, worked out a new idea. Three pre-bundled

spring assemblies were strapped onto an inexpensive pallet. When the springs reached the assembly line, the steel strapping was left on the individual spring bundles until they were mounted in place. This bundle method cut handling costs 50%!

we'll help you, too!

If you want to try palletizing for the first time, or improve your present methods, we'll help you, too. To have a Signode man call, write

SIGNODE

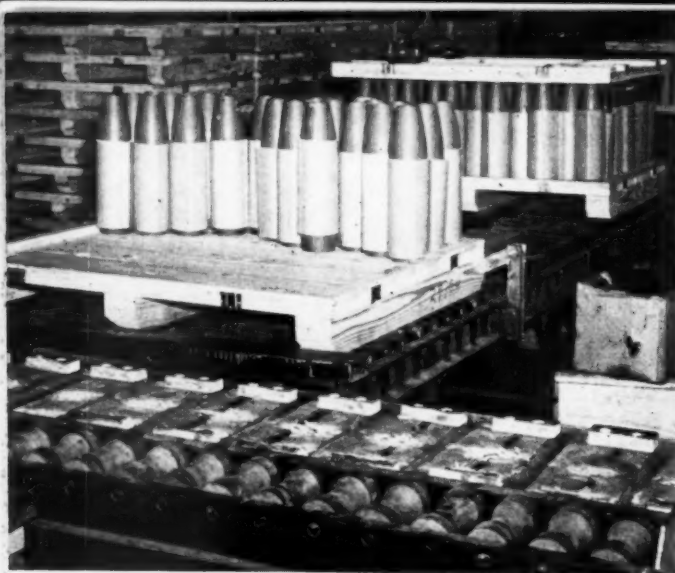
Steel Strapping Company

2639 N. Western Ave., Chicago 47, Ill.

this seal means security in shipping



Offices Coast to Coast.
In Canada: Canadian Steel Strapping Co., Ltd.
Foreign Subsidiaries and Distributors World Wide

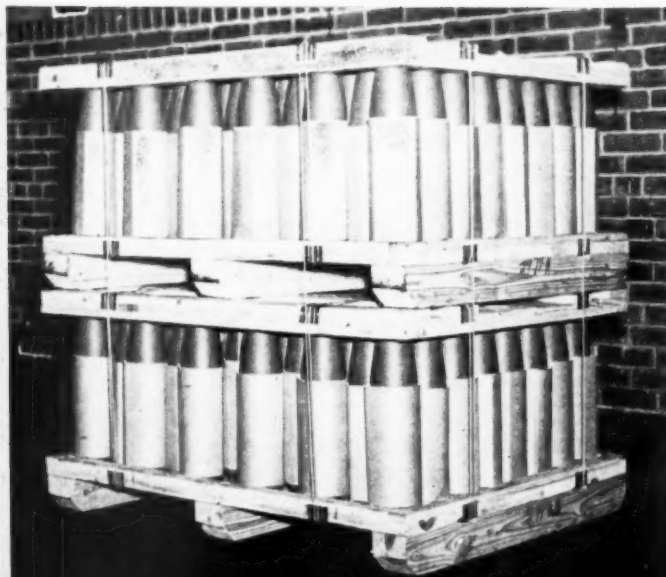


A



B

C



A short cut in dunnage

by George Muehlbach

SUPERINTENDENT, MATERIAL AND CONTROL, CHEVROLET-ST. LOUIS SHELL DIVISION PLANT, ST. LOUIS, MISSOURI



For the past eight months the Chevrolet-St. Louis Shell Division, which operates a government-owned plant to produce shells for the U. S. Army, has been using an improved method of car blocking which effects con-

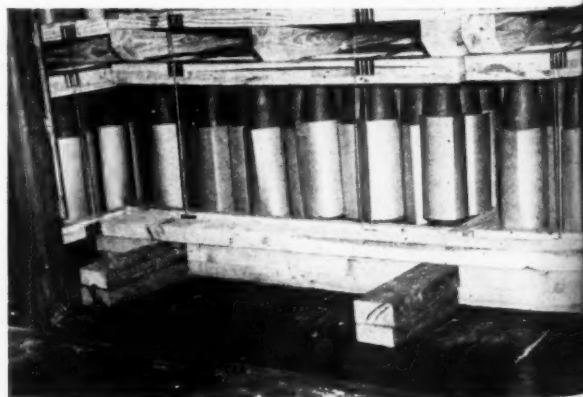
siderable saving, not only in loading out the palletized shells but in unloading them at the Ordnance receiving plant.

The new method practically eliminates the labor involved in constructing wooden bracing. Instead, metal blocking angles are installed, having been proved by impact tests to be able to meet conditions well beyond anything that would be encountered in normal moving and switching operations.

In shipping operations, the finished shells are protected by corrugated fibre board sleeves and placed on a wooden pallet (Photo A). A total of 83 shells are thus nested and a wooden cover is placed on top and the package bound together with four strands of steel wire strapping (Photo B). The complete pallet weighs 2299 pounds. Pallets are then double-decked and strapped together (Photo C), and are ready for loading.

Cars used for shipment must have a capacity of more than 100,000 pounds, for the total weight of shipment without dunnage, is 110,352 pounds. Such cars are loaded with ten sets of double pallets along the sidewall

before



AUGUST • 1932 finish

Blocking methods

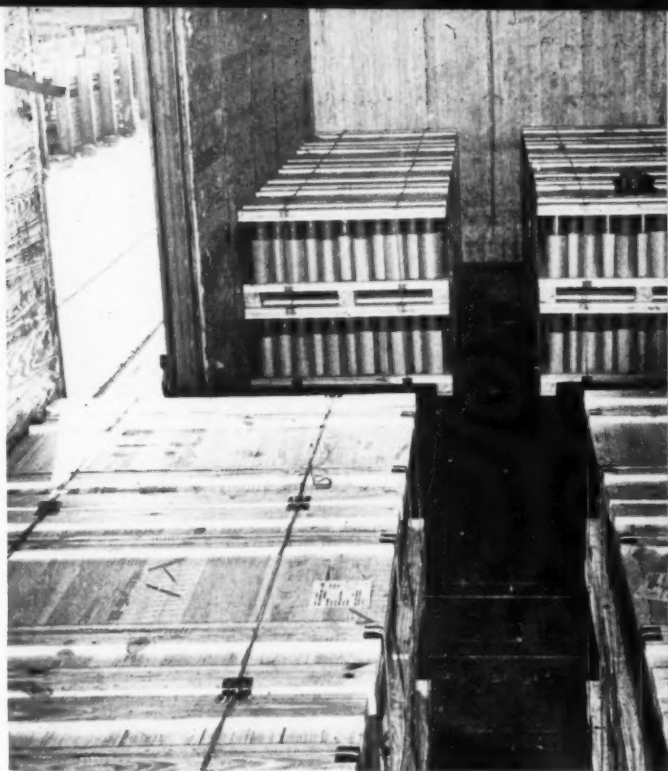
Change in method resulted in 60% reduction in damage, 50% in material, 70% in labor

each end of the car. This leaves a space approximately 24 inches wide in the center length of the car (Photo D). Each double-decked pallet is held in place by two blocking angles (Photo E). When each end of the car has been filled and four double pallets have been set in the doorway, also secured by angles, a space which is normally six to eight inches wide is left across the center of the car. This is the only place where wooden blocking is used (Photo F).

Previous to establishing this method of blocking, tests were conducted with the approval of the Ordnance Corps and the assistance of representatives of Car Blocking, Inc. A representative of the Western Weighing and Inspection Bureau was present to witness the tests, which culminated in a report from the receiving end: "Inspection of these two loads showed loads in good shape, no damage, no shifting."

Experience over the past eight months, during which the new method has been in use, has developed the fact that compared with the former method of blocking which we used, savings amount to a reduction in damage of 60%, in material of 50%, and in labor of 70%, with no complaints on condition of shipments arriving at destination. A statement from the receiver reported that considerable savings in unloading operations had been effected as well.

Additional before-and-after photos may be found on Page ST-3 of this issue.



D

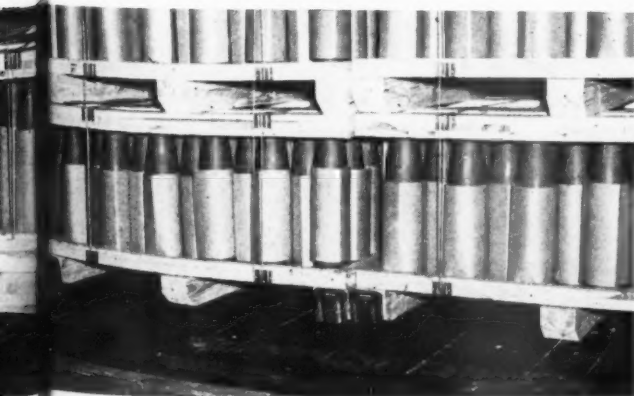


E



F

after



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a low cost Collapsible Pallet Box

**Engineered to meet
your requirements**

check



Here's a money saver for in-plant storage and handling of materials and for outside shipments too. Its low initial cost will save thousands of dollars for plants using pallets in quantity.

check



The B-G Collapsible Wood Pallet Box is light in weight but built strongly enough to handle weights up to 5000 lbs. and is rugged enough to stand up under many repeated shipments.

check



The collapsible feature is made possible by the exclusive Bigelow-Garvey TIGHT CORNER hinge design used on all of our collapsible wood shipping crates.

Used as a storage box, a tote box or as a shipping container, you will like this sturdy but inexpensive addition to effective materials handling.

MODEL B

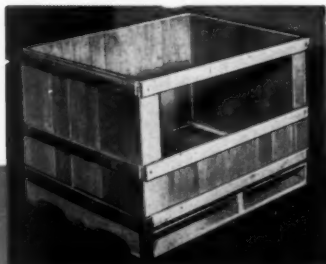


Photo shows front opening for easy access to contents when stacked one on top another or in racks. Furnished with or without self-locking insert panel.

MODEL C



B-G Pallet Box attached to standard pallet by means of four corner irons and a single steel strap, showing the hinged drop leaf for easy access when pallet boxes are stacked or tiered.

MODEL A



Photo shows hinged box collapsed for storage or return shipment. Pallet Boxes can be furnished with or without Tops for all models.

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Pallets



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Boxes



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Unitizing of materials for mass production handling

by Ray Chalmers •

SENIOR MATERIALS HANDLING ENGINEER, CHEVROLET MOTOR DIVISION,
GENERAL MOTORS CORPORATION, DETROIT, MICHIGAN

IT may be very difficult for many people to conceive the enormity of the materials handling problems which accrue from mass production of the yearly models and myriad products of General Motors, ranging from automotive and appliance to defense products.

But as C. E. Wilson, president of General Motors, analyzes the problem, "The way to eat an elephant is to cut it up into small pieces and then feed the pieces to a whole lot of people."

Since we are in civilian and defense production, we are heeding this counsel and drawing upon the practical knowledge and experience of materials handling men in the various divisions. The working groups keep up to date on new improvements and disseminate this "know-how" to our divisions. This interchange of knowledge by means of bulletins is resulting in a wider application of the best methods.

As an example of keeping up-to-date on new improvements, several members of the General Motors conveyor sub-committee visited a banana warehouse. We have no bananas, but we *do* have conveyors. The purpose of the visit was to see a battery-powered conveyor. The question was, "Can we apply this idea at General Motors?"

But this article does not deal with conveyors. It deals with *unitizing of materials for mass production handling*. The stem of bananas is an exemplification of my subject. This stem consists of a multiplicity of fingers individually wrapped for protection. This unitized pack is of such

hardness, height, weight, shape and size that it is being unloaded at the rate of two tons per manhour. Its contents are radially supported on the stem which can be stood on the floor for shipping, or hung from above for processing. The pack is



RAY CHALMERS

constructed of sub-assemblies, called hands, which become merchants' packages. Each of these merchants' packages is readily divisible into individually wrapped over-the-counter packages with inherent customer appeal.

"All manufacturing, engineering and quality efforts are in vain if the product reaches its destination in a damaged condition."

Calculated risks

This slogan of the National Safe Transit Committee is accepted verbatim as the ideal. However, if we consider economic and transportation realities, we must be prepared to accept a certain percentage of failures,

within commercial reason, or, in military terms, "calculated risks."

The unitization of incoming and outgoing materials is revolutionizing the method of handling. In general, we now handle containers in place of materials! The unit load is basic, the container incidental. Regardless of the type of container used, the important factor is the method of loading that container. Greater economy is obtained through the use of the unit load as more material can be moved at a single time.

Materials handling on par with engineering, manufacturing

One of the most important points we can stress here is that if maximum efficiency is to be derived from materials handling, top management must give the job equal status with such posts as engineering, manufacturing, research and the like. Materials handling must have top rank rating if we are going to achieve its great potentiality for higher efficiency and lower costs.

The concept of efficient materials handling should begin with the manner in which raw materials are brought into the plants, and should end only after the finished products are on their way to the customers.

Don't sell materials management short. If you do, you are slamming the door on the greatest potential for profit left in the business.

Recognition of the science of materials handling

We all know that, in a few short years, recognition of the science of materials handling has ascended at an ever-accelerating rate. Today, we,

who grew up with it, know its possibilities, and its perils. People with this knowledge are all too few in number. It's difficult to find qualified materials handling personnel. Therefore, industry must train these people accordingly, and make their jobs attractive.

A never-ending task

One of the aspects about materials handling that I like the most is that the job is never finished.

General Motors reviews continuously and studies intensively all matters affecting the transfer of materials and products to, through, and from the manufacturing and assembly units. This policy is directly responsible for increased productivity, high quality, and major reductions in cost.

Materials management is the last frontier of cost reduction

No new or unknown mechanical

device not available to industry is responsible for this increase in manufacturing efficiency. This efficiency comes mainly from an extensive and intensive application of known methods and equipment, spurred on by the

knowledge that materials management is the last frontier of cost reduction.

Adapted from an address before the American Management Association's 1952 Packaging Conference.

PROMOTING MATERIALS HANDLING EDUCATIONAL PROGRAM

In order to help engineering students better equip themselves for industrial service in the fast-growing technology of materials handling, 78 major equipment manufacturers (acting through The Material Handling Institute) and 3000 professional material handling engineers (acting through the American Material Handling Society) have joined hands with leaders in the field of engineering education to form an autonomous College-Industry Committee on Materials Handling Education.

The Committee's work will be dedicated to five objectives:

1. To make available to colleges and other study groups material of recognized quality for use in courses on materials handling.
2. To initiate development of new material, not presently available, for use in such courses.
3. To become known as a source and authority on sound good-quality information for materials handling courses.
4. To stimulate more teaching of materials handling (and the importance of materials handling) in the nation's colleges and universities.
5. To determine from industry what skills and understanding it requires in the materials handling engineers the colleges turn out.

At the organization meeting in New York City recently, the following group of 11 was constituted as the basic work force, with four more leaders in engineering education to be added this summer as the program gets under way:

Prof. Harold T. Amrine, Purdue University; Prof. W. Van Alan Clark, Jr., Massachusetts Institute of Technology.

D. H. Bitney, Union Steel Products Co.; E. W. McCaul, Jervis B. Webb Co.; J. Leo Cooke, Cooke Warehouse Corp.; Russell F. Hurst, Bigelow Sanford Carpet Co.; Vincent J. Reade, Whitehead Metal Products Co.; Otto G. Schwenk, Blaw-Knox Co.; J. W. Wunsch, Silent Hoist & Crane Co.

Howard M. Palmer (temporary chairman), Lewis-Shepard Products, Inc.; A. K. Strong (temporary secretary), American Cyanamid Co.

By the time the Committee reconvenes in Cleveland this fall, task subcommittees will assess costs, plan financing, select a permanent chairman from the engineering college field, and outline first steps.

Although conceived jointly by AMHS and MHI, the new body will be free-standing and take its cue directly from the engineering colleges in answer to whose perennial requests





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Milwaukee, Sheboygan, Winchendon. General Box Company of Mississippi,
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ST-13

for better educational material the activity was organized.

To add the four additional men from the engineering teaching world, invitations to serve on the Committee and cooperate with the activity are currently being tendered to Cornell, Michigan State, Wayne and Columbia.

NST COMMITTEE MOVES OFFICES

New offices of the National Safe Transit Committee are located in the

Dupont Circle Building, 1346 Connecticut Avenue, N.W., Washington 6, D.C.

NST CERTIFICATION FOR BRYANT, WESTINGHOUSE DIVISIONS

The National Safe Transit Committee has announced the certifications of Bryant Heater Division, Affiliated Gas Equipment, Inc., Indianapolis, Indiana, and the Standard Control Division of Westinghouse

Electric Corp., Beaver, Pennsylvania.

These two new certifications bring to 105 the number of manufacturing plants cooperating in the National Safe Transit Program.

WOODEN BOX ASSN. HOLDS SUMMER MEETING IN COLORADO

At the National Wooden Box Association's summer meeting, held at the Broadmoor, Colorado Springs, Colo., June 9-11, Kenneth S. Macy, representing the Ordnance Ammunition Center, Joliet, Illinois, told the group that peak demand for ammunition boxes, under present schedules, will be reached during the first half of 1953.

Members also had the opportunity of hearing several key speakers representing government agencies and installations. Also, several directors of purchases and of quality control from ordnance establishments participated in a conference dealing with the procurement and inspection of ammunition boxes.

PACKAGING INSTITUTE FORUM IN NEW YORK CITY, OCT. 20-22

The Packaging Institute's 14th annual forum will be held at Hotel Commodore, New York, October 20-22. Among the seminars will be one on packaging of office equipment, and one on developments in unit packaging.

INTERNATIONAL PAPER

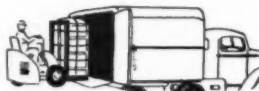
NAMES WESTERN SALES MGR.

W. S. Snyder, manager of the container division, International Paper Company, New York City, has announced the appointment of S. B. DeMian as manager of western sales.

DeMian, who joined the container division in 1945, has been manager of the division's Chicago plant since 1949. He will succeed C. F. Buckley, manager of the division's Kansas City plant, who served as western sales manager. Buckley will continue to manage the Kansas City plant.

Succeeding DeMian as manager of the Chicago plant, is S. R. Van Horne, Jr., formerly assistant sales manager at Chicago.

FROM YOUR PLANT . . .



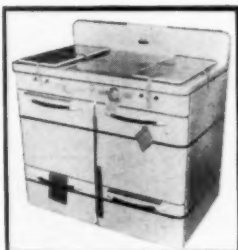
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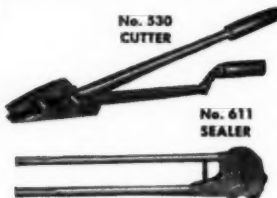
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Its soft Kraft paper outer layer won't scuff or damage the finest enamel finish. Inner layer of steel strap defies shipping shocks.

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No. 530
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No. 611
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The Stretcher pulls $\frac{3}{4}$ " or $1\frac{1}{4}$ " wide strap taut, and the Sealer applies the seal. The Cutter quickly and easily severs new strap from reel, or excess strap after tightening. It also removes and salvages strap from incoming crates.

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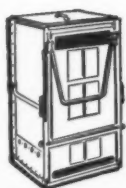
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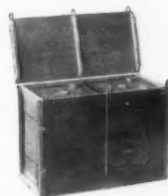
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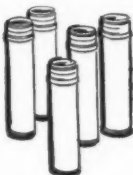
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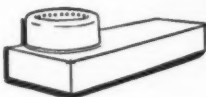
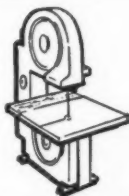
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AAR NAMES FRANK GIBSON TO CERAMIC ENGINEER POST

The Freight Loss and Damage Prevention Section of the Association of American Railroads has announced the appointment of Frank B. Gibson as ceramics engineer.

Gibson's experience consists of 22 years in the ceramics industry, serving in the capacity of plant superintendent and porcelain enamel super-

intendent. He is well versed in industrial processes. In one particular instance, he was responsible for reduc-

ing porcelain scrap from 40¢ per cabinet to 3¢ per cabinet on a project involving 250,000 to 300,000 units.

INDUSTRIAL PACKAGING, HANDLING SHOW, OCTOBER 14-16

The importance to top management of scientific protective packaging and materials handling as profit-making functions will be emphasized at the 7th annual Industrial Packaging and Materials Handling Exposi-

tion to be held at the Coliseum, Chicago, October 14, 15 and 16.

"Making Profits through Packaging and Materials Handling" will be the theme of the show. It will be dramatized in the annual Protective Packaging and Materials Handling Competition. It also will underlie the curriculum for the "Short Course in Packaging and Materials Handling" to be conducted October 13-16 at the Coliseum under the sponsorship of the College of Engineering, Department of Mechanical Engineering, University of Illinois Extension Division.

Both the exposition and the competition are sponsored by the Society of Industrial Packaging and Materials Handling Engineers.

"The Engineer's Role in Cost Reduction" will be discussed by Dr. William L. Everitt, dean, University of Illinois College of Engineering, at the opening of the Short Course.

General chairman of the exposition is R. C. Cragg, Gould National Batteries, Inc. Heading the competition are A. S. Roberts, Insurance Company of North America, general chairman; R. G. Anderson, Sperry Gyroscope Co., associate chairman for packaging; and C. R. Gustafson, American Radiator & Standard Sanitary Corp., associate chairman for materials handling.

Competition is divided into seven groups with the following chairmen:

Group I (corrugated or solid fibre boxes)—F. R. Campbell, Armstrong Cork Co.
Group II (nailed wood boxes and crates)—E. J. Dahill, Association of American Railroads.

Group III (wirebound boxes and crates)—E. R. Stivers, Package Research Lab.

Group IV (cleated panel boxes)—P. H. Paulsen, Wm. H. McGee & Co., Inc.

Group V (general)—K. W. Kraus, Thompson Products Co.

Group VI (export packages)—H. J. Benzie, General Electric Company.

Group VII (materials handling)—R. L. Franing, International Harvester Co.

In addition to the blue ribbon and \$100 first prize, red ribbon and \$50 second prize, and white ribbon and \$25 third prize in each group, the Harold Jackson Trophy, and the Irving J. Stoller Award will be presented.



Cleated Fibre Shipping Containers

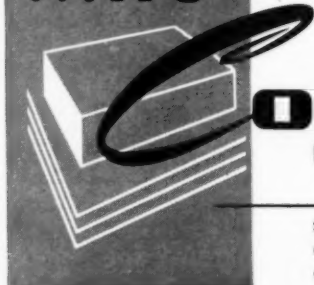
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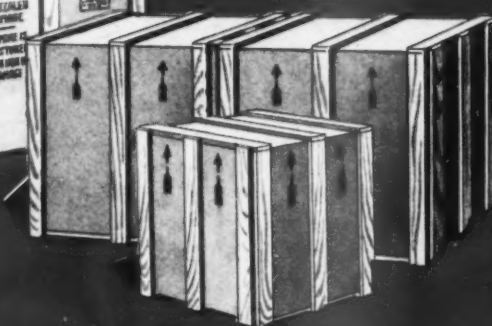


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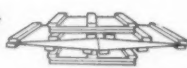
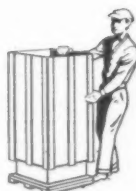


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QUICK Assembly line packing is speeded up. Easy to handle. Complete protection for your product.

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Light in weight, the Watkins Container is quickly and easily assembled to completely enclose your finished product, saving labor . . . saving time . . . saving expense. The container arrives at your plant 75% assembled.

You get complete product protection: protection from outside dirt and dust . . . protection inside for fine product finishes—smooth interior with no staples or rough surfaces to damage the product.

Add to these advantages the "Traveling Billboard" feature (advertising can be printed in two colors on four sides) and you will see why more and more manufacturers of appliances and other valuable finished products are shipping the "Watkins way".

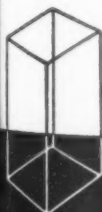
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CRATE-RITE MFG. CORP., Division of Pacific Ports Ind. Inc.	10901 Russet Street, Oakland, California
DURA-CRATES, INC.	940 East Michigan Street, Indianapolis, Indiana
GENERAL BOX CO., 1825 Miner St., Des Plaines, Illinois, and 16th and Maple Sts., Louisville, Kentucky	Watseka, Illinois
HEMB & MARTIN MFG. CO.	811 Center Street, Plainfield, Illinois
ILLINOIS BOX & CRATE CO.	1715 West Canal Street, Milwaukee, Wisconsin
KIECKHEFER BOX & LUMBER CO.	10212 Denton Road, Dallas, Texas
LANE CONTAINER CORP.	243 Singer Street, Lewisburg, Ohio
LEWISBURG CONTAINER CO.	608 South Commerce Street, Wichita, Kansas
LOVE MFG., INC.	

—an inquiry to any of these companies will get prompt attention—

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MCCRAY REFRIGERATOR

BUYS PALMER MFG. STOCK

McCray Refrigerator Co., Inc., of Kendallville, Indiana, is reported to have purchased all outstanding stock of Palmer Manufacturing Co., of Phoenix, Arizona. Founded in 1909, Palmer produces gas heating equipment, air coolers, ventilation and exhaust fans.

VOSS BROS. PURCHASED

BY KARTRIDG-PAK MACHINE

Voss Bros. Mfg. Co., of Davenport, Iowa, 76-year-old producer of home laundry equipment, has been purchased by Kartridg-Pak Machine Co., Chicago, manufacturers of packing machines. W. W. McCallum, president of the Chicago firm, said there will be no change in Voss operations.

TOPUBLISH "CERAMICSMONTHLY"

Louis G. Farber and Spencer L. Davis, technical secretary and assistant secretary respectively, of the American Ceramic Society, have resigned to publish "Ceramics Monthly", a new magazine devoted to the art, craft and hobby branches of the ceramics field. Farber is editor of the new magazine, and Davis is advertising and business manager.

ABBE ENGINEERING V. P. DIES

Henry F. Kleinfeldt, vice president, Abbe Engineering Company, died recently.